Click here to go back to Table of Contents

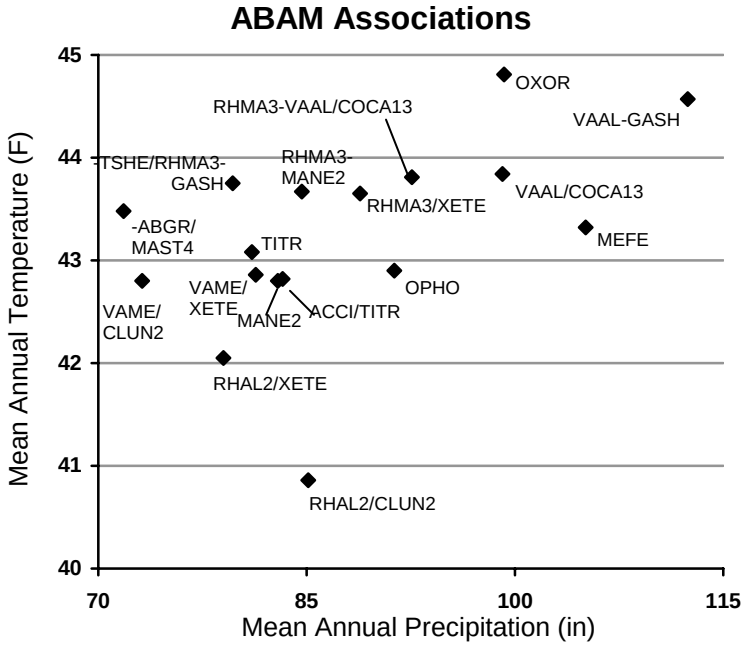
Click here to view wildlife habitat document

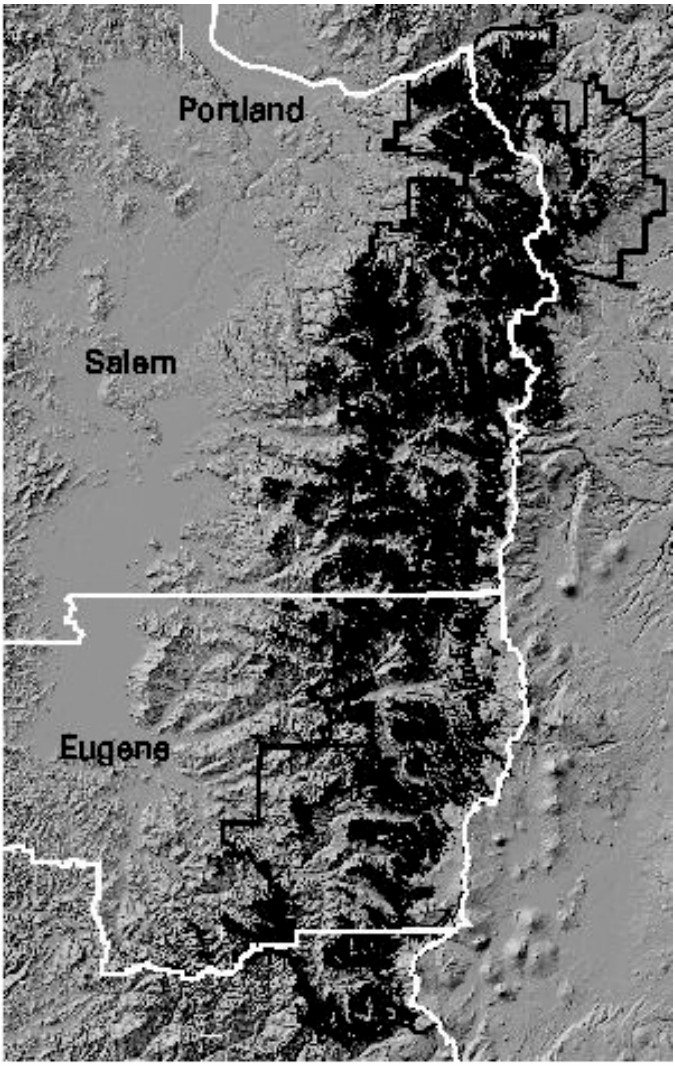
Introduction to the Pacific silver fir series

The Pacific silver fir zone occurs at higher elevations than the western hemlock series but below the mountain hemlock series. Growing seasons are generally short, dry, and cool, and summer frosts common in openings at upper elevations and/or on flat topography. Winters are wet and snow packs can be persistent.

The soil descriptions for this series are taken from the Plant Association and Management Guide for the Pacific Silver Fir Zone in the Mt. Hood and Willamette National Forests (1982) except where noted.

The graph below shows the relative distribution of the plant association plot averages for mean annual temperature versus total annual precipitation (data from Oregon Climate Service's statewide GIS layers).





Pacific silver fir series distribution

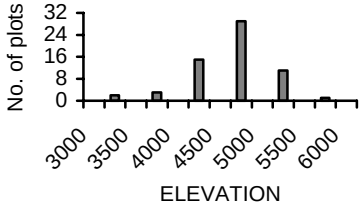
Series distribution (in black) from 2001 draft USFS R6 Potential Natural Vegetation model (Henderson, in prep).

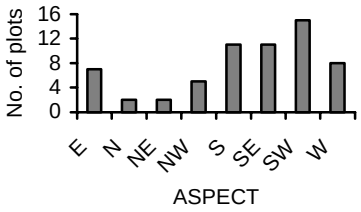
Pacific silver fir-grand fir/starry false Solomon's seal
Abies amabilis-Abies grandis/Maianthemum stellatum
ABAM-ABGR/MAST4
CFC311
N=61 (WILL=60; SBLM=1)

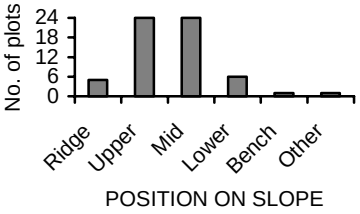
Environment and Distribution

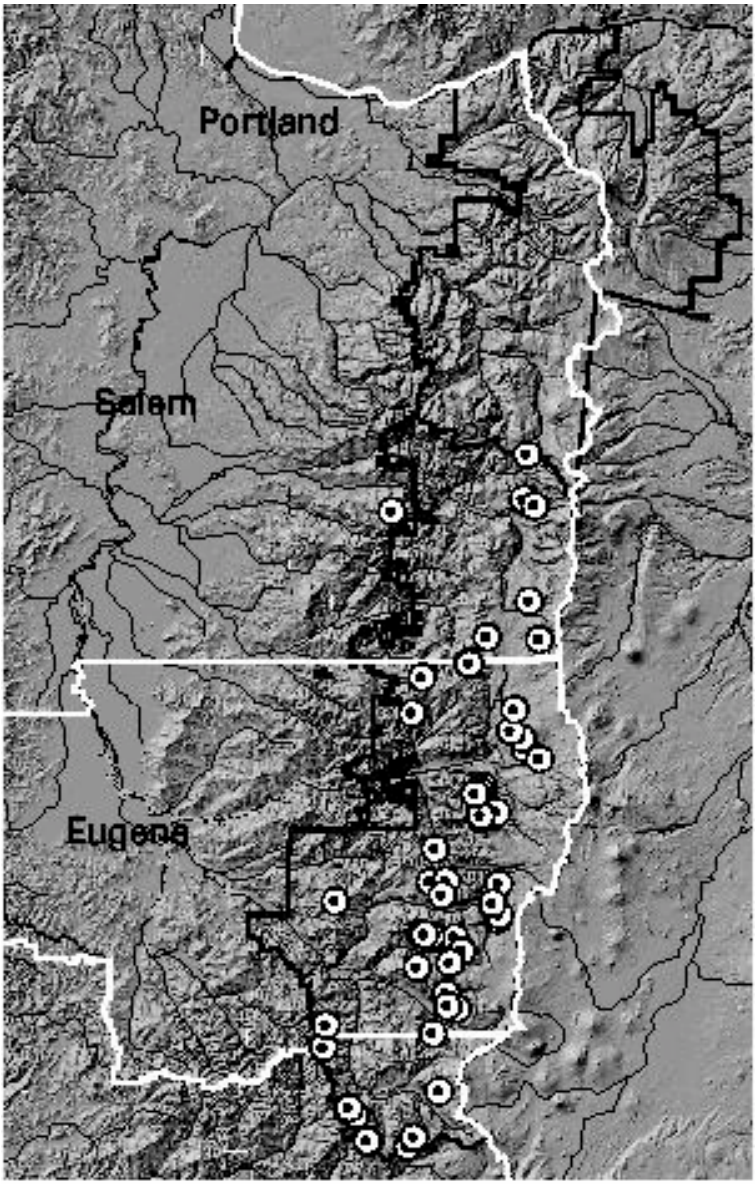
This plant association occurs only south of the Mt. Hood NF. Distribution of grand fir in the interior of the western Cascades is from the Clackamas drainage south. ABAM-ABGR/MAST4 is found at an average elevation of 4,578 feet (range 3,150-5,700 feet). The average annual precipitation for the plots surveyed is about 72 inches, which makes this the driest in the Pacific silver fir series. Plots are located on gentle to steep slopes, averaging 37% (range 5-70%) on mid to upper slope positions. Warm southerly aspects are most common.

Soils vary from shallow to deep, and often contain abundant coarse fragments. Effective rooting depth averages 28 inches in 40 sample plots where soils are recorded. Soils information for this plant association only comes from the Plant Association and Management Guide; Willamette National Forest (1987).









ABAM-ABGR/MAST4

Silver fir

Vegetation Composition, Structure, and Diversity

Overstory in the ABAM-ABGR/MAST4 association is dominated by Douglas-fir and Pacific silver fir. Canopy closure of mature trees averages 61%, and understory tree cover averages 13%.

Common name	Code	Constancy	Cover
Overstory			
Douglas-fir	PSME	85	38
Grand fir	ABGR	72	19
Pacific silver fir	ABAM	54	12
Western hemlock	TSHE	43	12
Noble fir	ABPR	39	24
Understory			
Grand fir	ABGR	67	7
Pacific silver fir	ABAM	64	9
Western hemlock	TSHE	54	4
Shrubs			
Baldhip rose	ROGY	70	5
Prince's pine	CHUM	61	6
Creeping snowberry	SYMO	54	5
Dwarf Oregon grape	MANE2	52	6
Trailing blackberry	RUUR	49	2
Blue huckleberry	VAME	48	6
Vine maple	ACCI	44	22
Little prince's pine	CHME	43	2
Dwarf bramble	RULA2	39	7
Herbaceous			
Starry false Solomon's seal	MAST4	95	35
Vanilla leaf	ACTR	85	15
Coolwort foamflower	TITR	74	7
Pathfinder	ADBI	72	5
Three-leaved anemone	ANDE	70	5
Queencup beadlily	CLUN2	67	8
Wild ginger	ASCA2	64	5
Oregon bedstraw	GAOR	64	5
Sweetscented bedstraw	GATR3	59	3
Scouler's bluebell	CASC7	57	4
Houndstoungue hawkweed	HICY	57	2
Sweet cicely	OSCH	57	3
Western brackenfern	PTAQ	57	7
Sidebells wintergreen	ORSE	56	2
Rattlesnake plantain	GOOB2	54	1

Low-shrub cover averages 27% while tall-shrub cover averages 12%. This plant association is the most herbaceous of the ABAM series, averaging 72% cover. Starry false Solomon's seal and vanilla leaf dominate the herb layer. Moss cover averages 4%, lowest in the series.

The average age for the 44 stands sampled for age in the ABAM-ABGR/MAST4 association is 131 years (range 66-206 years). Live basal area averages 339 ft^2/acre (range 80-600 ft^2/acre).

Management Implications

ABAM-ABGR/MAST4 indicates substantial winter snow accumulation and relatively moist soils. Sites are not usually droughty, but regeneration can be difficult due to rocky soils, summer frost, and high evaporative demand. Care should be taken to minimize loss of duff and topsoil, which contain a substantial share of the available nitrogen on most sites.

	Site Index ABAM	Site Index ABGR *	Site Index ABPR	Site Index PSME
Mean	52	76	119	132
SE	8	3	7	4
Range	44-59	51-106	99-160	70-180
Age	91	114	124	151
n	2	17	9	52

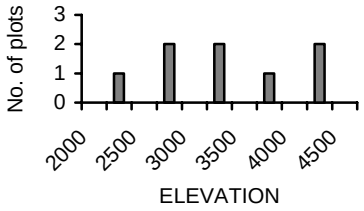
* SI for ABGR is calculated for base age 50; SI for others is calculated for base age 100.

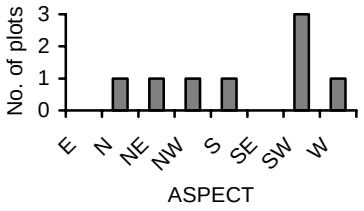
Pacific silver fir-western hemlock/rhododendron-salal
Abies amabilis-Tsuga heterophylla/Rhododendron macrophyllum-Gaultheria shallon
ABAM-TSHE/RHMA3-GASH
CFC251
N=8 (MTH=5; WILL=3)

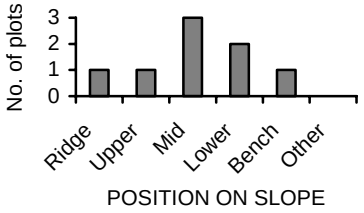
Environment and Distribution

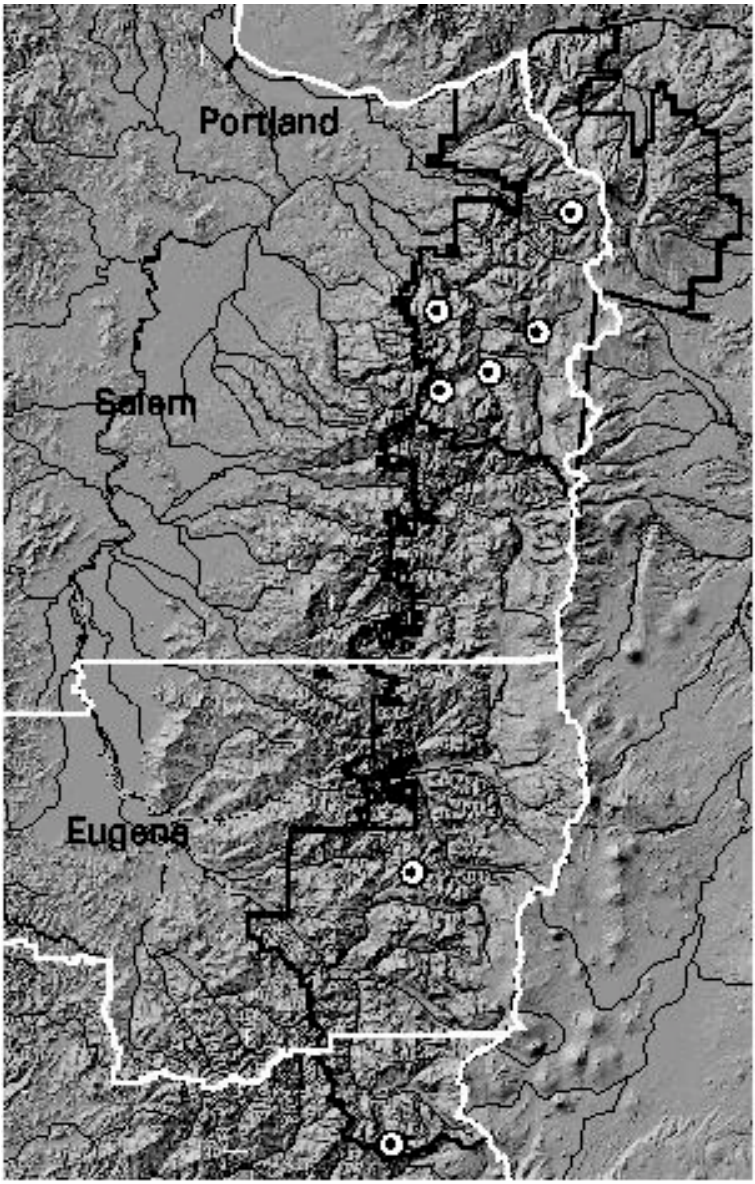
ABAM-TSHE/RHMA3-GASH is found at an average elevation of 3,238 feet (range 2,100-4,100 feet). The average annual precipitation for the plots surveyed is about 80 inches. It is one of the warmest, driest associations in the series. Plot slopes average 32% (range 5-60%) on a variety of aspects and slope positions.

Soils are shallow to moderately deep. They are sandy loam or loam with clay at depth, stony or very stony, and are well drained. Parent material is usually colluvium.









ABAM-TSHE/RHMA3-GASH

Vegetation Composition, Structure, and Diversity

Overstory in the ABAM-TSHE/RHMA3-GASH association is dominated by Douglas-fir, western hemlock and Pacific silver fir. Canopy closure of mature trees average 62%, and understory tree cover averages 10%. This is one of the most shrubby and least herbaceous plant associations in the ABAM series. Low-shrub cover averages 65%, and is dominated by salal and dwarf Oregon grape. High-shrub cover averages 48% and is dominated by rhododendron. Herb cover averages 16%. Moss coverage averages 23%.

Common name	Code	Constancy	Cover
Overstory			
Douglas-fir	PSME	100	27
Western hemlock	TSHE	100	19
Pacific silver fir	ABAM	75	12
Western redcedar	THPL	50	8
Grand fir	ABGR	33	10
Understory			
Pacific silver fir	ABAM	75	4
Western hemlock	TSHE	75	6
Chinquapin	CHCH7	50	2
Shrubs			
Salal	GASH	100	32
Rhododendron	RHMA3	100	50
Dwarf Oregon grape	MANE2	88	19
Red huckleberry	VAPA	63	7
Little prince's pine	CHME	50	6
Prince's pine	CHUM	50	12
Vine maple	ACCI	38	18
Herbaceous			
Rattlesnake plantain	GOOB2	50	2
Vanilla leaf	ACTR	38	4
Pacific trillium	TROV	38	2

Average age for the 4 stands sampled in the ABAM-TSHE/ RHMA3-GASH is 192 years (range 104-250 years). Live basal area averages 307 ft^2/acre (range 200-480 ft^2/acre) in the 3 plots sampled.

Management Implications

ABAM-TSHE/RHMA3-GASH productivity may be limited by low nitrogen, especially where rhododendron is abundant. The climate is warm and dry, and summer frost is rare. The risk of competition from snowbrush, huckleberries, vine maple and rhododendron is moderate.

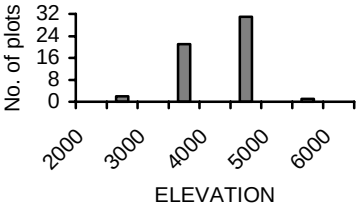
	Site Index ABAM	Site Index PSME	Site Index TSHE
Mean	77	103	107
SE	12	9	2
Range	40-94	63-150	101-114
Age	138	266	161
n	4	9	5

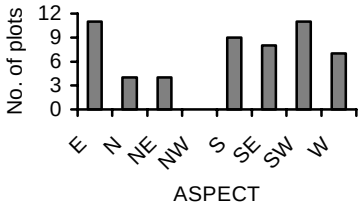
Pacific silver fir/vine maple/coolwort foamflower
Abies amabilis/Acer circinatum/Tiarella trifoliata
ABAM/ACCI/TITR
(Old code: ABAM/ACCI/TIUN)
CFS651
N=55 (MTH=13; WILL=41; SBLM=1)

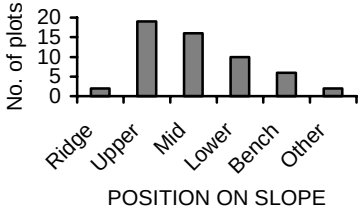
Environment and Distribution

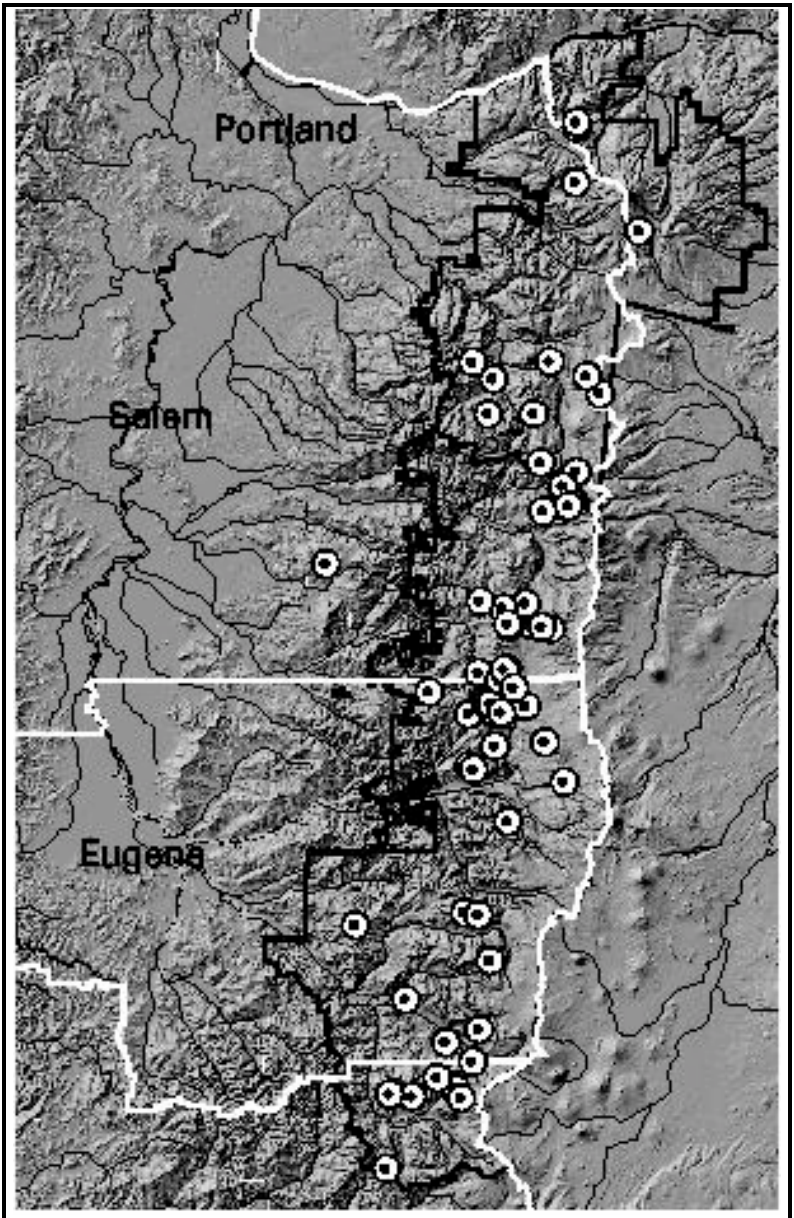
This plant association occurs throughout the Pacific silver fir zone except for the high precipitation areas where ABAM/OXOR is more common. ABAM/ACCI/TITR is found at an average elevation of 3,979 feet (range 2,160-5,200 feet). The average annual precipitation for the plots surveyed is about 83 inches. Plots are located on upper to mid slope positions on warm aspects. Slopes average 35% (range 0-77%).

Soils are deep, fine textured to moderately stony, loamy sand or sandy loam. They are moist through mid-summer and well drained. Parent material is colluvium, glacial till or residuum.









ABAM/ACCI/TITR

Silver fir

Vegetation Composition, Structure, and Diversity

Overstory in the ABAM/ACCI/TITR association is dominated by Douglas-fir and Pacific silver fir. Canopy closure of mature trees averages 75%, and understory tree cover averages 12%. Low-shrub cover averages 23%. High-shrub cover averages 36% and is dominated by vine maple. Herb cover averages 52% and is dominated by vanilla leaf, queencup beadlily and starry false Solomon's seal. Moss cover averages 10%, relatively low for the series.

Common name	Code	Constancy	Cover
Overstory			
Douglas-fir	PSME	98	35
Pacific silver fir	ABAM	87	14
Western hemlock	TSHE	76	16
Noble fir	ABPR	65	17
Understory			
Pacific silver fir	ABAM	91	11
Western hemlock	TSHE	64	6
Shrubs			
Vine maple	ACCI	98	34
Prince's pine	CHUM	65	7
Blue huckleberry	VAME	62	5
Baldhip rose	ROGY	53	5
Dwarf Oregon grape	MANE2	49	9
Little prince's pine	CHME	49	1
Trailing blackberry	RUUR	49	2
Dwarf bramble	RULA2	44	5
Creeping snowberry	SYMO	35	3
Herbaceous			
Vanilla leaf	ACTR	91	11
Queencup beadlily	CLUN	89	5
Starry false Solomon's seal	MAST4	78	10
Three-leaved anemone	ANDE	75	3
Coolwort foamflower	TITR	75	6
Rattlesnake plantain	GOOB2	69	2
Pacific trillium	TROV2	69	2
Bunchberry dogwood	COCA13	58	8
Pathfinder	ADBI	53	3
Wild ginger	ASCA2	51	5

Average age for the 24 stands sampled in ABAM/ACCI/TITR is 172 years (range 86-250 years). Live basal area averages 338 ft^2/acre (range 200-620 ft^2/acre) in the 35 plots sampled.

Management Implications

ABAM/ACCI/TITR is productive for timber and forage. Soils are moist and compactable. Shrub competition can be intense several years after clear cutting.

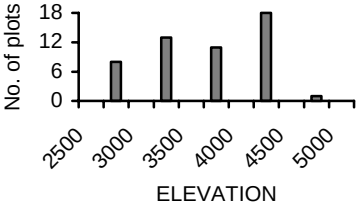
	Site Index ABAM	Site Index ABPR	Site Index PSME
Mean	65	133	119
SE	16	6	3
Range	49-80	100-160	80-170
Age	100	147	187
n	2	12	36

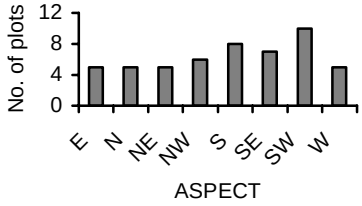
Pacific silver fir/dwarf Oregon grape
Abies amabilis/Mahonia nervosa
ABAM/MANE2
CFS151
N=51 (MTH=25; WILL=24; EBLM=1; SBLM=1)

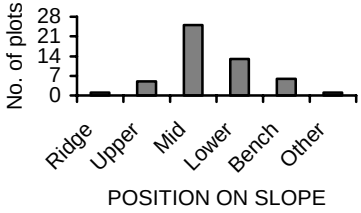
Environment and Distribution

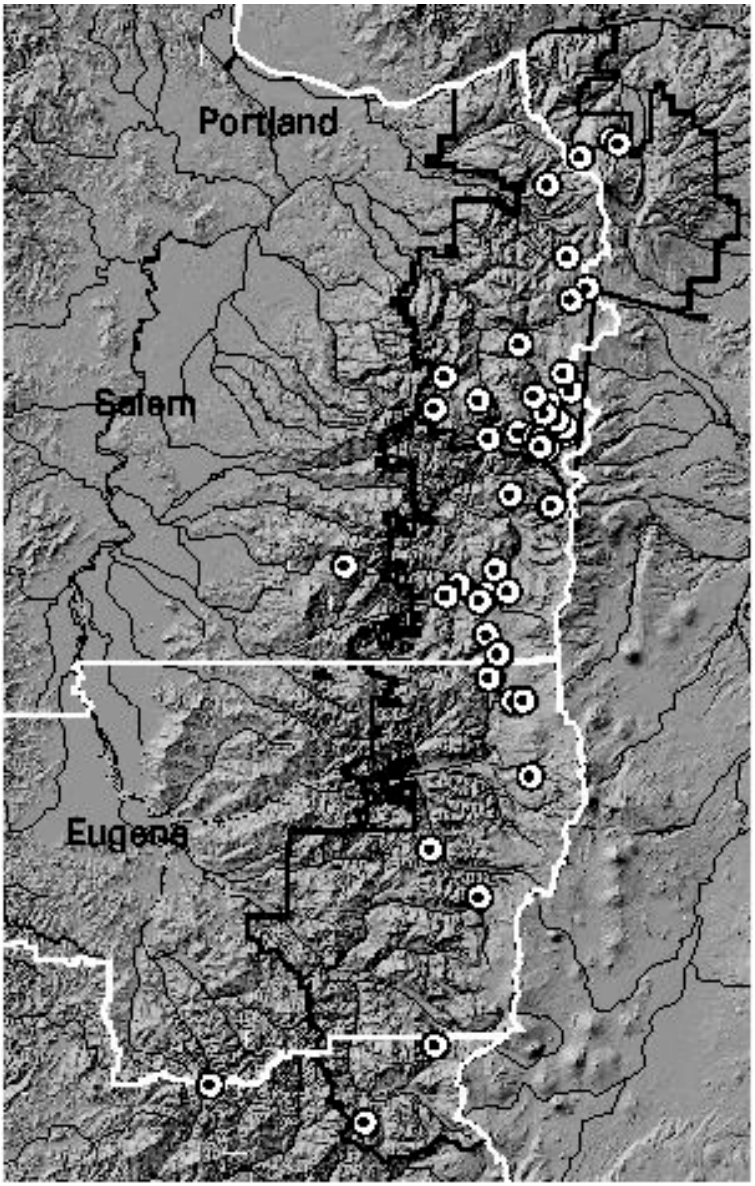
This association is most common in the northern Willamette and Mt. Hood NFs. It is generally in the lower elevations of the series. ABAM/MANE2 is found at an average elevation of 3,627 feet (range 2,580-4,800 feet). The average annual precipitation for the plots surveyed is about 83 inches. Slopes average 33% (range 5-65%). They occur on all aspects, on mid to lower slope positions.

Soils are shallow to deep, moderately stony and well drained but occasionally droughty. They are sandy loams or clay loams. Parent material is variable, but usually colluvium or residuum.









ABAM/MANE2

Vegetation Composition, Structure, and Diversity

Overstory in the ABAM/MANE2 association is dominated by Douglas-fir, western hemlock and Pacific silver fir. Canopy closure of mature trees averages 77%, and understory tree cover averages 17%. Low-shrub cover averages 19% and is dominated by dwarf Oregon grape. High-shrub cover averages 16%. The herbaceous cover averages 32%. Moss cover averages 23%.

Common name	Code	Constancy	Cover
Overstory			
Douglas-fir	PSME	100	32
Western hemlock	TSHE	92	19
Pacific silver fir	ABAM	80	11
Western redcedar	THPL	35	13
Understory			
Pacific silver fir	ABAM	88	11
Western hemlock	TSHE	88	10
Pacific yew	TABR2	37	7
Shrubs			
Dwarf Oregon grape	MANE2	98	18
Prince's pine	CHUM	84	6
Vine maple	ACCI	67	15
Trailing blackberry	RUUR	63	2
Blue huckleberry	VAME	61	5
Baldhip rose	ROGY	55	3
Oregon boxwood	PAMY	51	3
Rhododendron	RHMA3	41	6
Little prince's pine	CHME	35	2
Dwarf bramble	RULA2	31	2
Herbaceous			
Vanilla leaf	ACTR	71	9
Twinflower	LIBO3	61	7
Bunchberry dogwood	COCA13	59	5
Rattlesnake plantain	GOOB2	57	2
Pacific trillium	TROV2	53	2
Sidebells wintergreen	ORSE	51	2
Three-leaved anemone	ANDE	45	2
Coolwort foamflower	TITR	45	2
Evergreen violet	VISE3	45	3

Average age for the 19 stands sampled in ABAM/MANE2 is 186 years (range 63-407 years). Live basal area averages 337 ft^2/acre (range 180-520 ft^2/acre) in the 24 plots sampled.

Management Implications

ABAM/MANE2 is moderately productive for timber. Soils are dry to droughty, but well drained. Frost is not usually a problem. Competition from vine maple and ceanothus may follow canopy removal and soil disturbance.

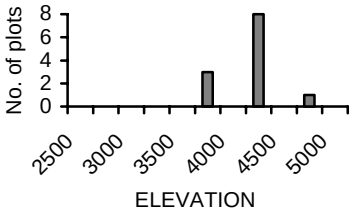
	Site Index ABAM	Site Index ABPR	Site Index PSME
Mean	45	126	115
SE	-	8	3
Range	-	100-160	73-140
Age	189	194	192
n	1	6	33

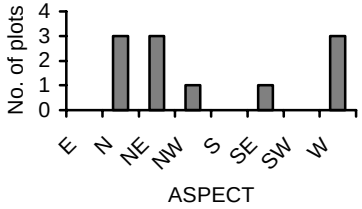
Pacific silver fir/fool's huckleberry
Abies amabilis/Menziesia ferruginea
ABAM/MEFE
CFS254
N=11 (MTH=7; WILL=3; SBLM=1)

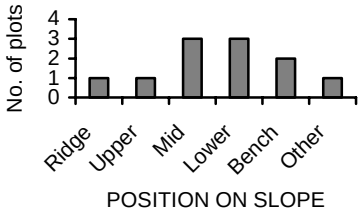
Environment and Distribution

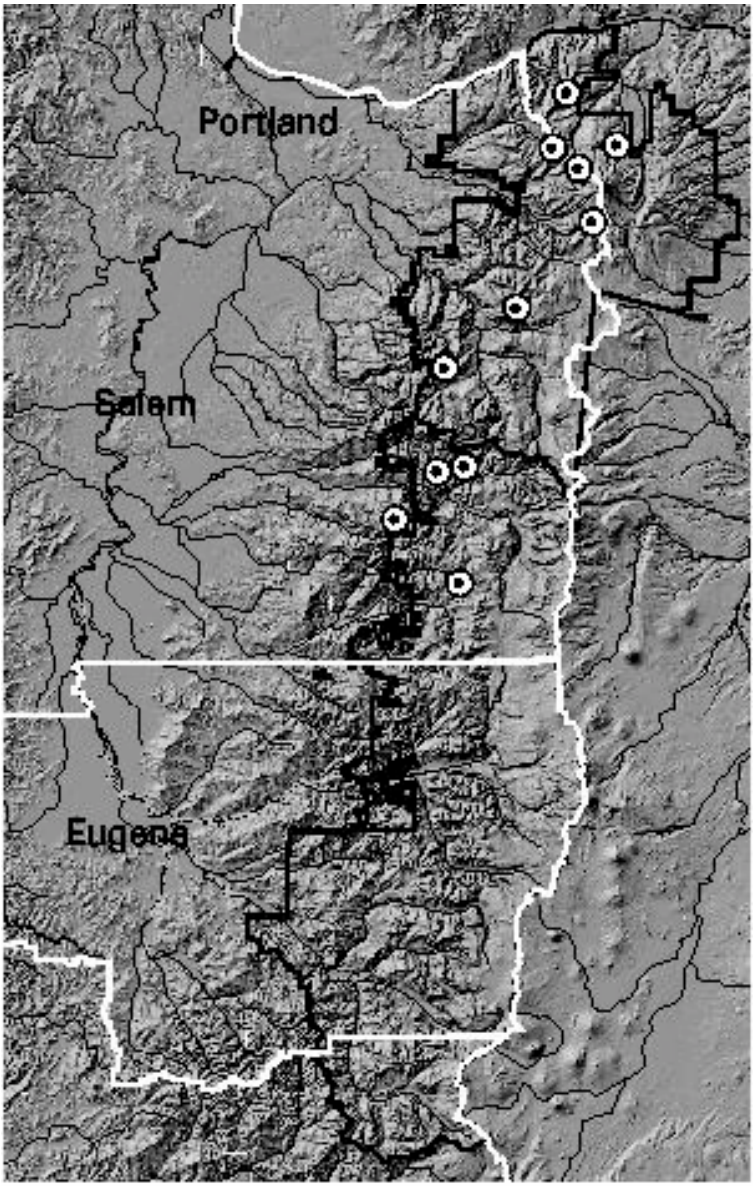
This uncommon association is found in the northern Willamette and Mt. Hood NFs. ABAM/MEFE is found at an average elevation of 4,147 feet (range 3,800-4,420 feet). The average annual precipitation for the plots surveyed is about 105 inches, which makes it the second wettest in the series. Plots are located on cooler aspects, mainly on mid to lower slope positions or on benches. Slopes average 25% (range 0-85%).

Soils are moderately shallow, stony to very stony and moist but usually well drained. They are sandy loams, silt loams, and clay loams. Parent material is usually glacial till or colluvium.









ABAM/MEFE

Silver fir

Vegetation Composition, Structure, and Diversity

Overstory in the ABAM/MEFE association is dominated by Pacific silver fir. Canopy closure of mature trees averages 59%, and understory tree cover averages 17%. This is one of the most shrubby plant associations in the ABAM series. Low-shrub cover averages 15%, and is dominated by fool's huckleberry or blue huckleberry, although Alaska huckleberry or oval-leaf huckleberry can also be present in large amounts. High-shrub cover averages 53%. Herb cover averages 42% cover. Beargrass and queencup beadlily are usually present and can dominate the herb layer. Moss cover averages 20%.

Common name	Code	Constancy	Cover
Overstory			
Pacific silver fir	ABAM	100	30
Western hemlock	TSHE	73	24
Douglas-fir	PSME	55	16
Mountain hemlock	TSME	36	11
Understory			
Pacific silver fir	ABAM	100	13
Western hemlock	TSHE	73	4
Shrubs			
Fool's huckleberry	MEFE	100	14
Blue huckleberry	VAME	82	22
Dwarf bramble	RULA2	64	5
Alaska huckleberry	VAAL	64	18
Oval-leaf huckleberry	VAOV	55	25
Rhododendron	RHMA3	45	19
Western mountain ash	SOSI2	45	1
Herbaceous			
Beargrass	XETE	91	12
Queencup beadlily	CLUN2	82	9
Bunchberry dogwood	COCA	73	7
Coolwort foamflower	TITR	73	3
Pacific trillium	TROV2	73	1
Vanilla leaf	ACTR	64	7
Sidebells wintergreen	ORSE	64	1
Starry false Solomon's seal	MAST4	55	1
Rattlesnake plantain	GOOB2	45	3
Rosy twistedstalk	STRO	45	3

Average age for the 4 stands sampled in ABAM/MEFE is 191 years (range 70-247 years). Live basal area for the one plot sampled is 320 ft^2/acre.

Management Implications

ABAM/MEFE sites are cool to cold with soils that are moist and well drained. Snow packs are deep and long lasting. Tree growth is slow. Summer frost is frequent in cold air accumulation areas. Intense shrub competition can develop 4-5 years after clear cutting.

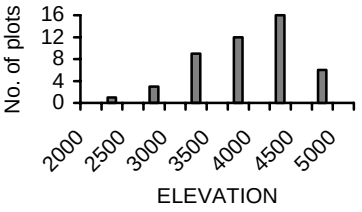
	Site Index ABAM	Site Index PSME	Site Index TSHE
Mean	72	84	71
SE	3	2	4
Range	51-88	82-89	64-79
Age	240	252	218
n	15	3	3

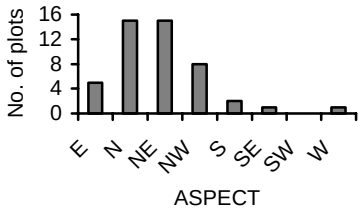
Pacific silver fir/devil's club
Abies amabilis/Oplopanax horridus
ABAM/OPHO
CFS351
N=47 (MTH=21; WILL=24; SBLM=2)

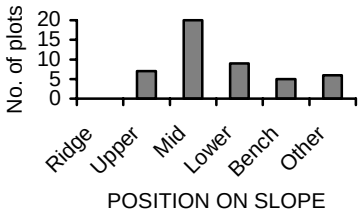
Environment and Distribution

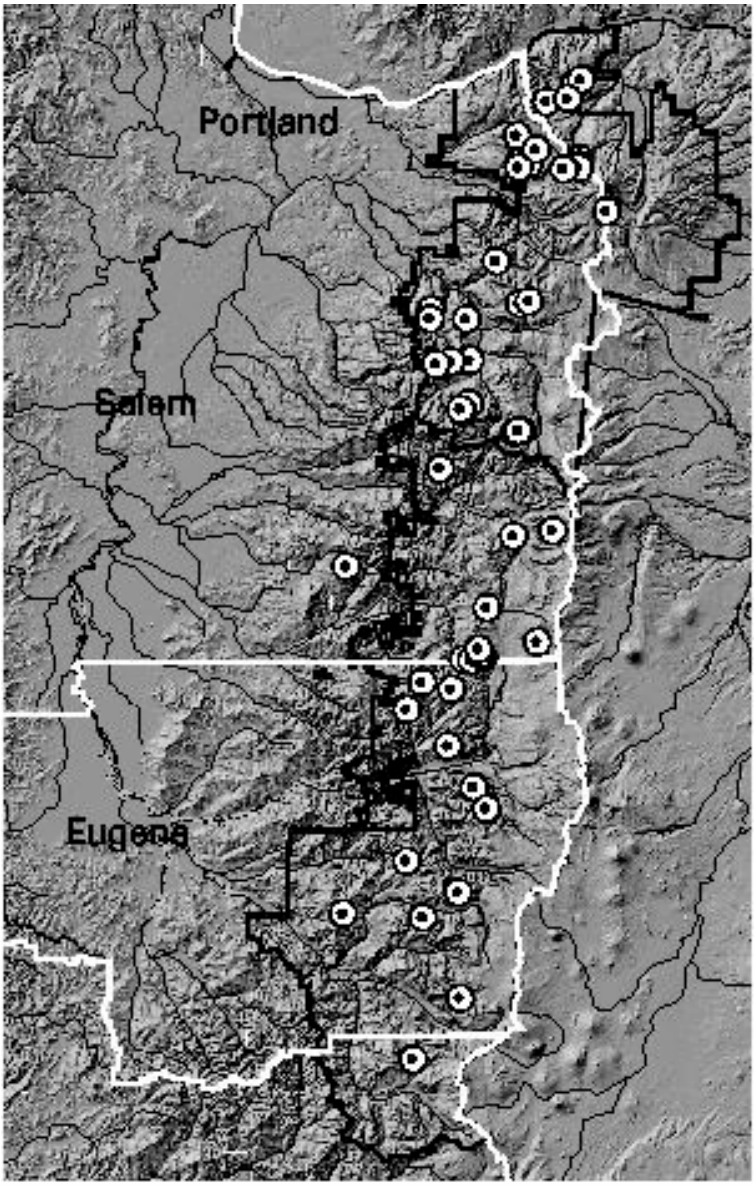
This plant association is most common in the highest precipitation areas. In the southern Willamette NF it is generally restricted to wet, cold cirque basins. ABAM/OPHO is found at an average elevation of 3,801 feet (range 2,300-4,700 feet). The average annual precipitation for plots surveyed is about 91 inches. Plot slopes average 37% (range 5-75%). Cool northern aspects are common. Plots are on middle to lower slopes or benches, often near riparian areas.

Soils are deep, moderately stony, sand silt or clay loams. They are wet but well aerated soils. Parent material is variable, usually colluvium residuum, or glacial till.









ABAM/OPHO

Silver fir

Vegetation Composition, Structure, and Diversity

Overstory in the ABAM/OPHO association is dominated by Pacific silver fir, western hemlock and Douglas-fir. Canopy closure of mature trees averages 57%, and understory tree cover averages 15%. Low-shrub cover averages 18%. High-shrub cover averages 31% and is dominated by devil's club, although vine maple can be present in large amounts. This is one of the most herbaceous plant associations in the ABAM series, averaging 66% cover. Coolwort foamflower, vanilla leaf, starry false Solomon's seal, and queencup beadlily are usually present and can dominate the herb layer. Moss cover averages 20%.

Common name	Code	Constancy	Cover
Overstory			
Pacific silver fir	ABAM	89	21
Western hemlock	TSHE	87	19
Douglas-fir	PSME	79	24
Noble fir	ABPR	34	12
Understory			
Pacific silver fir	ABAM	96	11
Western hemlock	TSHE	83	7
Western redcedar	THPL	26	5
Shrubs			
Devil's club	OPHO	96	36
Vine maple	ACCI	53	16
Blue huckleberry	VAME	49	4
Dwarf bramble	RULA2	43	3
Alaska huckleberry	VAAL	32	13
Oval-leaf huckleberry	VAOV	32	8
Dwarf Oregon grape	MANE2	30	6
Herbaceous			
Coolwort foamflower	TITR	89	10
Vanilla leaf	ACTR	85	8
Starry false Solomon's seal	MAST4	83	15
Queencup beadlily	CLUN2	81	6
Bunchberry dogwood	COCA13	72	10
Wild ginger	ASCA2	66	6
Common ladyfern	ATFI	62	9
Pacific trillium	TROV2	57	2
Insideout flower	VAHE	55	7
Western swordfern	POMU	53	4

Silver fir

Average age for the 17 stands sampled in ABAM/OPHO is 188 years (range 73-283 years). Live basal area averages 330 ft^2/acre range (40-640 ft^2/acre) in the 20 plots sampled.

Management Implications

ABAM/OPHO is highly productive for tree growth, although high water tables and shrub competition may impede Douglas-fir regeneration. Frost pockets may develop. Soils are usually saturated during the summer. Soil compaction should be avoided. Wildlife and watershed values are high.

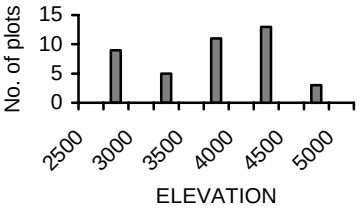
	Site Index ABAM	Site Index ABPR	Site Index PSME	Site Index TSHE
Mean	82	131	132	120
SE	8	17	3	5
Range	40-140	100-170	98-159	78-160
Age	178	257	204	235
n	12	4	25	17

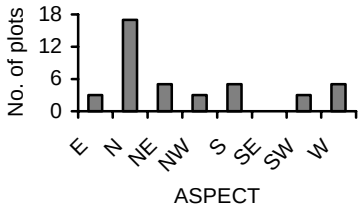
Pacific silver fir/Oregon oxalis
Abies amabilis/Oxalis oregana
ABAM/OXOR
CFF153
N=41 (MTH=17; WILL=9; SBLM=8; EBLM=7)

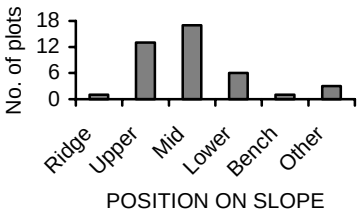
Environment and Distribution

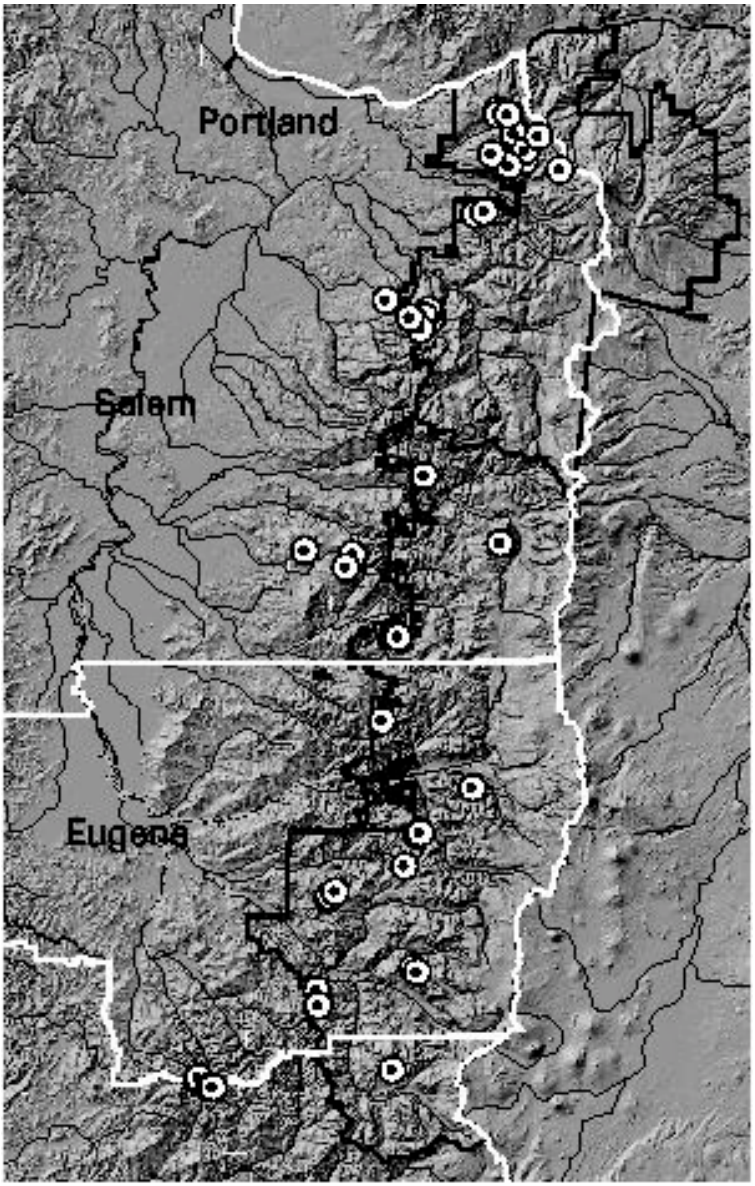
This plant association is concentrated in areas with high precipitation and warm mean annual temperatures. Its distribution is similar to that of ABAM/VAAL/COCA13, but at lower elevations. ABAM/OXOR is found at an average elevation of 3,665 feet (range 2,630-4,600 feet). The average annual precipitation for plots surveyed is about 99 inches. Plot slopes average 30% (range 0-70%). Northern aspects are most common. Plots are generally on upper and middle slope positions.

Soils are deep, moderately stony, silt loams, clay loams or loams. They are moist but well drained. Parent material is usually colluvium but occasionally glacial till.









ABAM/OXOR

Silver fir

Vegetation Composition, Structure, and Diversity

Overstory in the ABAM/OXOR association is dominated by Pacific silver fir, western hemlock and/or Douglas-fir. Canopy closure of mature trees averages 68%, and understory tree cover averages 15%. Low-shrub cover averages 11%, and high-shrub cover averages 20%. This is one of the most herbaceous plant associations in the ABAM series, averaging 60% cover. Oregon oxalis and coolwort foamflower are almost always present. Moss cover is low, averaging 9%.

Common name	Code	Constancy	Cover
Overstory			
Douglas-fir	PSME	93	25
Western hemlock	TSHE	90	20
Pacific silver fir	ABAM	66	21
Noble fir	ABPR	41	22
Western redcedar	THPL	32	8
Understory			
Pacific silver fir	ABAM	98	10
Western hemlock	TSHE	93	8
Shrubs			
Vine maple	ACCI	54	9
Rhododendron	RHMA3	54	11
Alaska huckleberry	VAAL	51	12
Red huckleberry	VAPA	49	3
Blue huckleberry	VAME	46	4
Trailing blackberry	RUUR	44	3
Dwarf Oregon grape	MANE2	41	4
Little prince's pine	CHME	32	1
Herbaceous			
Oregon oxalis	OXOR	100	31
Coolwort foamflower	TITR	95	7
Starry false Solomon's seal	MAST4	85	6
Vanilla leaf	ACTR	80	7
Queencup beadlily	CLUN2	78	2
Pacific trillium	TROV2	73	4
Bunchberry dogwood	COCA13	71	4
Insideout flower	VAHE	71	6
Western swordfern	POMU	66	3
Three-leaved anemone	ANDE	56	2
Gold thread	COLA3	49	4

Average age for the 18 stands sampled in ABAM/OXOR is 257 years (range 94-682 years). Live basal area averages 367 ft^2/acre (range 180-560 ft^2/acre) in the 9 plots sampled.

Management Implications

ABAM/OXOR is highly productive for timber and forage. Soils are moist and compactable but relatively well drained.

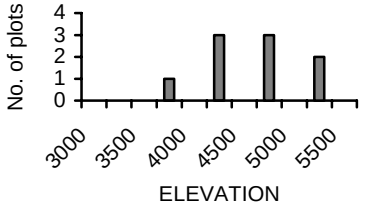
	Site Index ABAM	Site Index ABPR	Site Index PSME	Site Index TSHE
Mean	81	132	128	136
SE	6	4	4	4
Range	69-90	110-158	90-167	100-158
Age	174	242	212	221
n	3	19	26	21

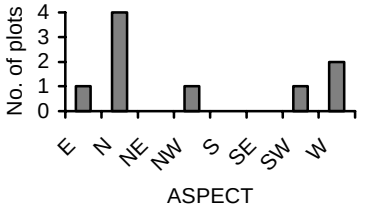
Pacific silver fir/Cascade azalea/queencup beadlily
Abies amabilis/Rhododendron albiflorum/Clintonia uniflora
ABAM/RHAL2/CLUN2
CFS552
N=9 (MTH=5; WILL=4)

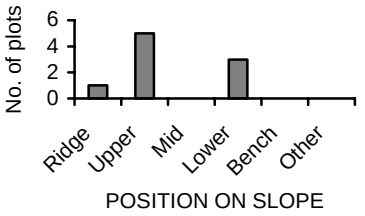
Environment and Distribution

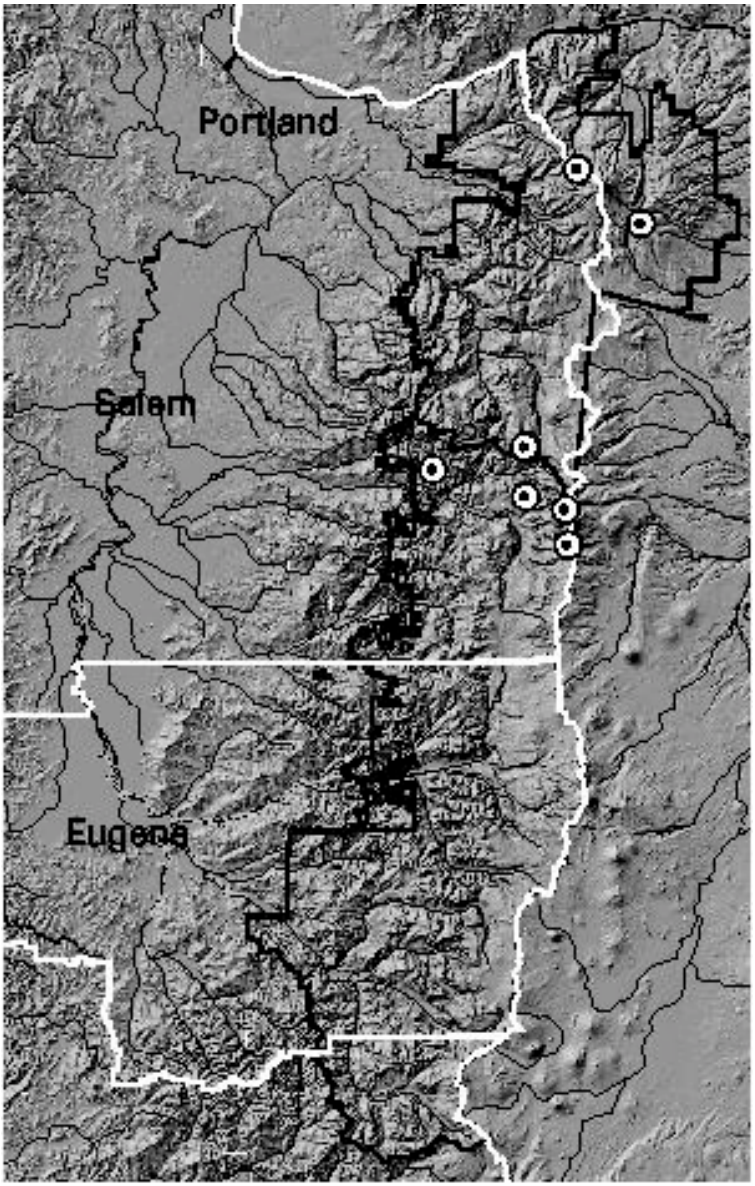
This is an uncommon association found in the northern Willamette and Mt. Hood NFs. ABAM/RHAL2/XETE and ABAM/RHAL2/CLUN2 are at the cool, dry end of the temperature-moisture gradient for the series. ABAM/RHAL2/CLUN2 is found at an average elevation of 4,546 feet (range 3,900-5,240 feet). The average annual precipitation for plots surveyed is about 85 inches. Slopes average 29% (range 3-78%). Cool northerly aspects are most common. Plots occupy upper and lower slope positions.

Soils are moderately deep, and stony with a variable soil texture ranging from sandy, silty or clay loams. They are wet or saturated most of the summer. Parent material is usually colluvium or residuum, and on rare occasions glacial till.









ABAM/RHAL2/CLUN2

Silver fir

Vegetation Composition, Structure, and Diversity

Overstory in the ABAM/RHAL2/CLUN2 association is dominated by Pacific silver fir. Canopy closure of mature trees averages 62%, and understory tree cover averages 24%. This is one of the most shrubby plant associations in the ABAM series. Low-shrub cover averages 28%, and Cascade azalea, dwarf bramble, and blue huckleberry are almost always present. High-shrub cover averages 65%. The herbaceous layer averages 45% cover. Moss cover averages 13%.

Common name	Code	Constancy	Cover
Overstory			
Pacific silver fir	ABAM	89	26
Western hemlock	TSHE	56	12
Mountain hemlock	TSME	56	8
Alaska cedar	CHNO	44	10
Understory			
Pacific silver fir	ABAM	100	13
Western hemlock	TSHE	56	5
Alaska cedar	CHNO	44	5
Shrubs			
Cascade azalea	RHAL2	100	30
Dwarf bramble	RULA2	100	4
Blue huckleberry	VAME	100	19
Oval-leaf huckleberry	VAOV	56	8
Western mountain ash	SOSI2	44	1
Prince's pine	CHUM	33	1
Alaska huckleberry	VAAL	33	19
Herbaceous			
Queencup beadlily	CLUN2	89	9
Beargrass	XETE	67	9
Sidebells wintergreen	ORSE	56	1
Coolwort foamflower	TITR	56	3
Vanilla leaf	ACTR	44	8
Three-leaved anemone	ANDE	44	3
Broadleaf arnica	ARLA8	44	9
Bunchberry dogwood	COCA13	44	13
Rosy twisted stalk	STRO	44	5
Sitka valerian	VASI	44	4

Silver fir

Average age for the 4 stands sampled in ABAM/RHAL2/CLUN2 is 261 years (range 239-287 years). Live basal area averages 260 ft^2/acre (range 160-360 ft^2/acre) in the 2 plots sampled.

Management Implications

ABAM/RHAL2/CLUN2 is a cold high elevation association where deep snow packs can accumulate and there are frequent summer frosts. Trees grow relatively slowly. Soils are moist and compactable.

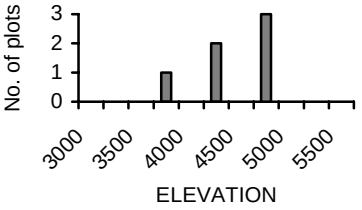
	Site Index ABAM	Site Index ABPR	Site Index TSHE
Mean	55	78	88
SE	10	18	-
Range	6-122	60-95	-
Age	194	242	239
n	10	2	1

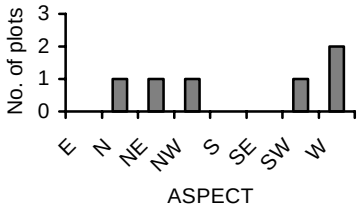
Pacific silver fir/Cascade azalea/beargrass
Abies amabilis/Rhododendron albiflorum/Xerophyllum tenax
ABAM/RHAL2/XETE
CFS551
N=6 (MTH=1; WILL=5)

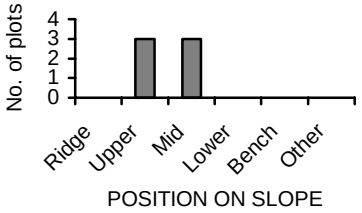
Environment and Distribution

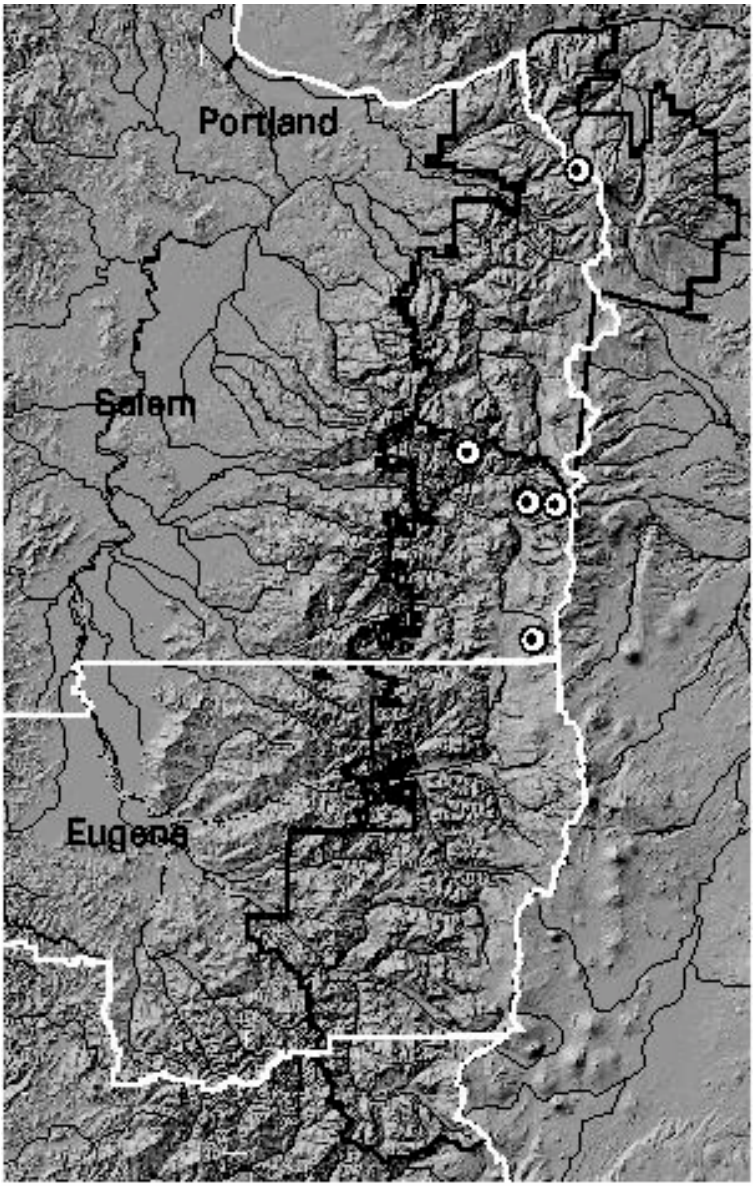
This is a rare plant association found in the northern Willamette and Mt. Hood NFs. ABAM/RHAL2/XETE and ABAM/RHAL2/CLUN2 are at the cool, dry end of the temperature-moisture gradient for the series. ABAM/RHAL2/XETE is found at an average elevation of 4,327 feet (range 3,500-4,860 feet). The average annual precipitation for plots surveyed is about 79 inches. Plots are on gentle to moderate slopes averaging 23% (range 13-36%) on cool aspects in upper to middle slope positions.

Soils are moderately shallow, stony to very stony, loamy sands, sandy loams and clay loams. They are wet but usually well drained. Parent material is variable, ranging from colluvium, glacial till or residuum.









ABAM/RHAL2/XETE

Vegetation Composition, Structure, and Diversity

Overstory in the ABAM/RHAL2/XETE association is dominated by Pacific silver fir. Canopy closure of mature trees averages 50%, and understory tree cover averages 5%. Low-shrub cover averages 5%. High-shrub cover averages 80%, making this one of the most shrubby plant associations in the ABAM series. The herbaceous layer averages 37% cover. Moss cover is low, averaging 8%.

Common name	Code	Constancy	Cover
Overstory			
Pacific silver fir	ABAM	83	46
Mountain hemlock	TSME	50	8
Noble fir	ABPR	33	3
Douglas-fir	PSME	33	18
Western hemlock	TSHE	33	15
Understory			
Pacific silver fir	ABAM	83	21
Alaska cedar	CHNO	33	4
Western hemlock	TSHE	33	3
Mountain hemlock	TSME	33	3
Shrubs			
Cascade azalea	RHAL2	100	21
Western mountain ash	SOSI2	83	2
Blue huckleberry	VAME	83	19
Dwarf bramble	RULA2	50	3
Rhododendron	RHMA3	33	10
Alaska huckleberry	VAAL	33	33
Herbaceous			
Queencup beadlily	CLUN2	50	3
Rattlesnake	GOOB2	50	1
Twinflower	LIBO3	50	2
Beargrass	XETE	50	47

Average age for the 4 stands sampled in ABAM/RHAL2/XETE is 182 years (range 169-203 years). Live basal area averages 350 ft^2/acre (range 320-400 ft^2/acre) in the 4 plots sampled.

Management Implications

ABAM/RHAL2/XETE is a cold high elevation association where deep snow packs melt late. Summers are cool, and summer frosts are common. Trees grow relatively slowly. Soils are moist and compactable.

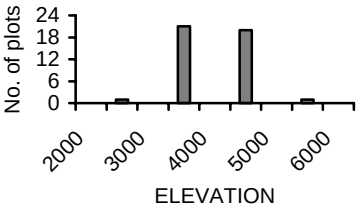
	Site Index ABAM	Site Index PSME
Mean	63	100
SE	12	-
Range	3-87	-
Age	177	187
n	6	1

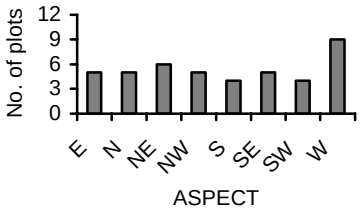
Pacific silver fir/rhododendron-dwarf Oregon grape
Abies amabilis/Rhododendron macrophyllum-Mahonia nervosa
ABAM/RHMA3-MANE2
CFS652
N=43 (MTH=10; WILL=29; EBLM=2; SBLM=2)

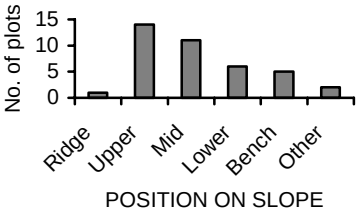
Environment and Distribution

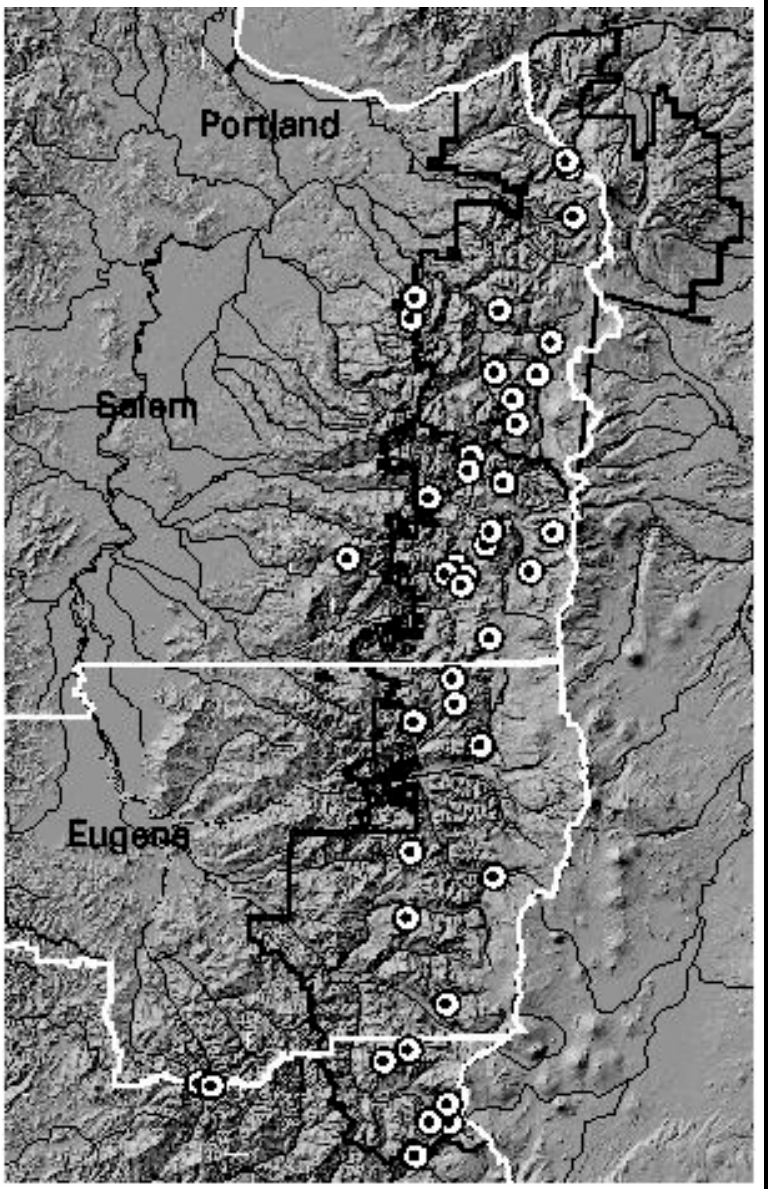
This is a widespread association in moderate precipitation zones. ABAM/RHMA3-MANE2 is found at an average elevation of 3,857 feet (range 2500-5300 feet). The average annual precipitation for plots surveyed is about 85 inches. Plots are located across all aspects on slopes averaging 34% (range 5-80%). Most plots are on upper to middle slope positions.

Soils are shallow to moderately deep, usually stony, with variable soil texture. They are well drained to droughty. Parent material is colluvium or residuum.









ABAM/RHMA3-MANE2

Vegetation Composition, Structure, and Diversity

Overstory in the ABAM/RHMA3-MANE2 association is dominated by Pacific silver fir and western hemlock. Canopy closure of mature trees averages 73%, and understory tree cover averages 11%. Low-shrub layer averages 32%. High-shrub cover averages 40% and rhododendron and dwarf Oregon grape are almost always present. Herbaceous cover averages 24%. Moss cover averages 15%.

Common name	Code	Constancy	Cover
Overstory			
Pacific silver fir	PSME	100	30
Western hemlock	TSHE	93	23
Pacific silver fir	ABAM	70	14
Noble fir	ABPR	37	15
Western white pine	PIMO3	30	5
Understory			
Pacific silver fir	ABAM	93	9
Western hemlock	TSHE	79	5
Shrubs			
Rhododendron	RHMA3	100	38
Dwarf Oregon grape	MANE2	86	15
Prince's pine	CHUM	77	5
Trailing blackberry	RUUR	56	2
Blue huckleberry	VAME	51	4
Red huckleberry	VAPA	47	3
Vine maple	ACCI	44	11
Oregon boxwood	PAMY	42	3
Little prince's pine	CHME	37	2
Baldhip rose	ROGY	30	1
Dwarf bramble	RULA2	30	4
Herbaceous			
Twinflower	LIBO3	77	9
Rattlesnake plantain	GOOB	63	2
Pacific trillium	TROV2	56	1
Bunchberry dogwood	COCA13	49	4

Average age for the 14 stands sampled in ABAM/RHMA3-MANE2 is 177 years (range 85-402 years). Live basal area averages 333 ft^2/acre (range 80-600 ft^2/acre) in the 30 plots sampled.

Management Implications

ABAM/RHMA3-MANE2 is moderately productive for timber. These sites have early summer snowmelt and a long, warm, relatively dry growing season. Sites with high rhododendron cover and few herbs are less productive and may be nitrogen limited. Shrub competition may be intense 4-5 years after cutting. Seedling shading may be necessary on south facing slopes.

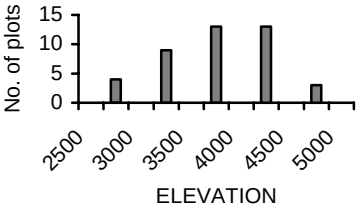
	Site Index ABAM	Site Index ABPR
Mean	94	109
SE	5	4
Range	70-120	90-140
Age	203	196
n	11	18

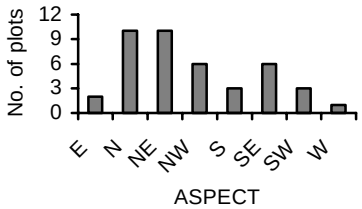
Pacific silver fir/rhododendron-Alaska huckleberry/bunchberry dogwood
Abies amabilis/Rhododendron macrophyllum-Vaccinium alaskense/Cornus canadensis
ABAM/RHMA3-VAAL/COCA13
CFS654
N=42 (MTH=6; WILL=34; SBLM=2)

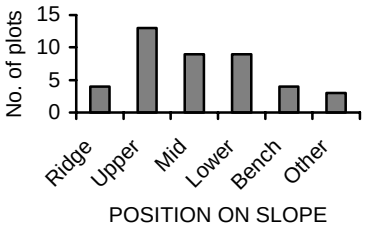
Environment and Distribution

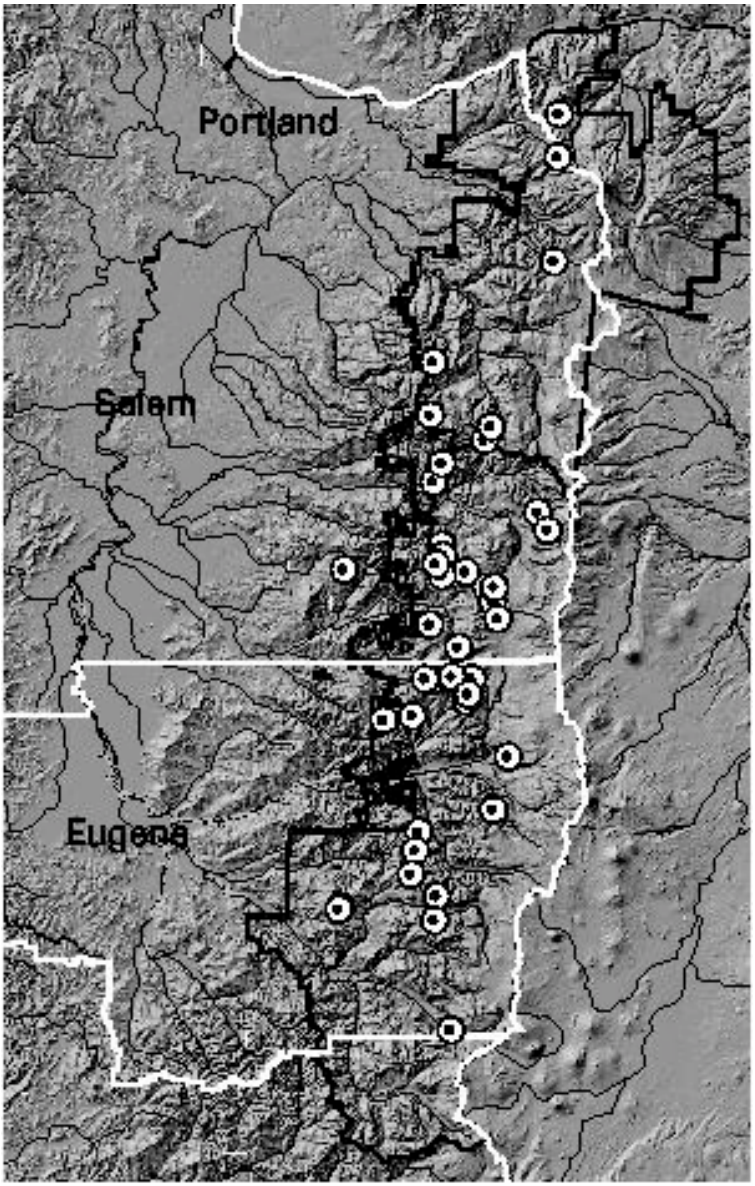
This association is most common in the moderate precipitation zone of the western Cascades. ABAM/RHMA3-VAAL/COCA13 is found at an average elevation of 3,725 feet (range 2,580-4,500 feet). The average annual precipitation for plots surveyed is about 93 inches. Plots average 27% slope (range 0-69%), on cool northerly aspects in upper to lower slope positions

Soils are moderately deep, fine textured to stony, sandy loam, clay loam or loam. They are well drained and moist in early summer. Parent material is colluvium or residuum.









ABAM/RHMA3-VAAL/COCA13

Vegetation Composition, Structure, and Diversity

Overstory in the ABAM/RHMA3-VAAL/COCA13 association is dominated by Douglas-fir, Pacific silver fir and western hemlock. Canopy closure of mature trees averages 70%, and understory tree cover averages 13%. This is one of the most shrubby associations in the ABAM series. Low-shrub cover averages 26%, and huckleberry is almost always present. High-shrub cover averages 44%. The herbaceous layer averages 38% cover and is dominated by bunchberry dogwood. Moss cover averages 23%.

Common name	Code	Constancy	Cover
Overstory			
Douglas-fir	PSME	98	25
Western hemlock	TSHE	90	21
Pacific silver fir	ABAM	86	15
Western redcedar	THPL	31	9
Noble fir	ABPR	29	10
Understory			
Pacific silver fir	ABAM	98	16
Western hemlock	TSHE	71	10
Shrubs			
Rhododendron	RHMA3	98	46
Alaska huckleberry	VAAL	81	20
Dwarf Oregon grape	MANE2	69	11
Dwarf bramble	RULA2	52	6
Prince's pine	CHUM	50	4
Blue huckleberry	VAME	50	9
Trailing blackberry	RUUR	43	3
Red huckleberry	VAPA	38	10
Vine maple	ACCI	36	15
Little prince's pine	CHME	36	2
Oregon boxwood	PAMY	29	8
Herbaceous			
Bunchberry dogwood	COCA13	95	14
Twinflower	LIBO2	69	12
Beargrass	XETE	67	6
Queencup beadlily	CLUN2	64	3
Rattlesnake plantain	GOOB2	57	2
Vanilla leaf	ACTR	48	6

Average age for the 6 stands sampled in ABAM/RHMA3-VAAL/COCA13 is 207 years (range 107-322 years). Live basal area averages 308 ft^2/acre (range 80-520 ft^2/acre) in the 33 plots sampled.

Management Implications

ABAM/RHMA3-VAAL/COCA13 is a moderately productive association. Drought may present a threat to seedling survival on south slopes, and rocky soils may inhibit planting elsewhere. Frost may occur in depressions and flat areas.

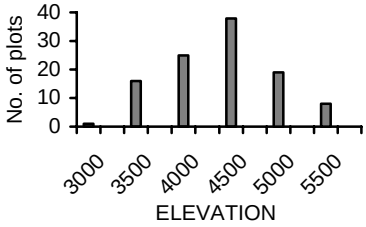
	Site Index ABAM	Site Index ABPR	Site Index PSME	Site Index TSHE
Mean	69	120	103	107
SE	3	20	8	6
Range	63-81	100-140	69-158	92-150
Age	236	292	232	224
n	5	2	12	9

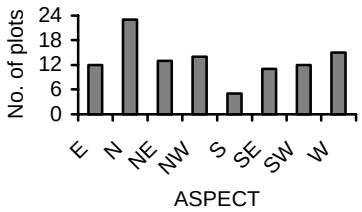
Pacific silver fir/rhododendron/beargrass
Abies amabilis/Rhododendron macrophyllum/Xerophyllum tenax
ABAM/RHMA3/XETE
CFS653
N=107 (MTH=1; WILL=88; EBLM=1; SBLM=3)

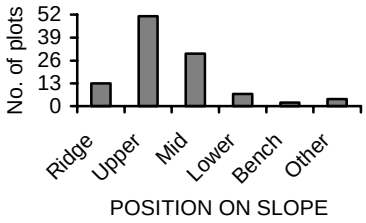
Environment and Distribution

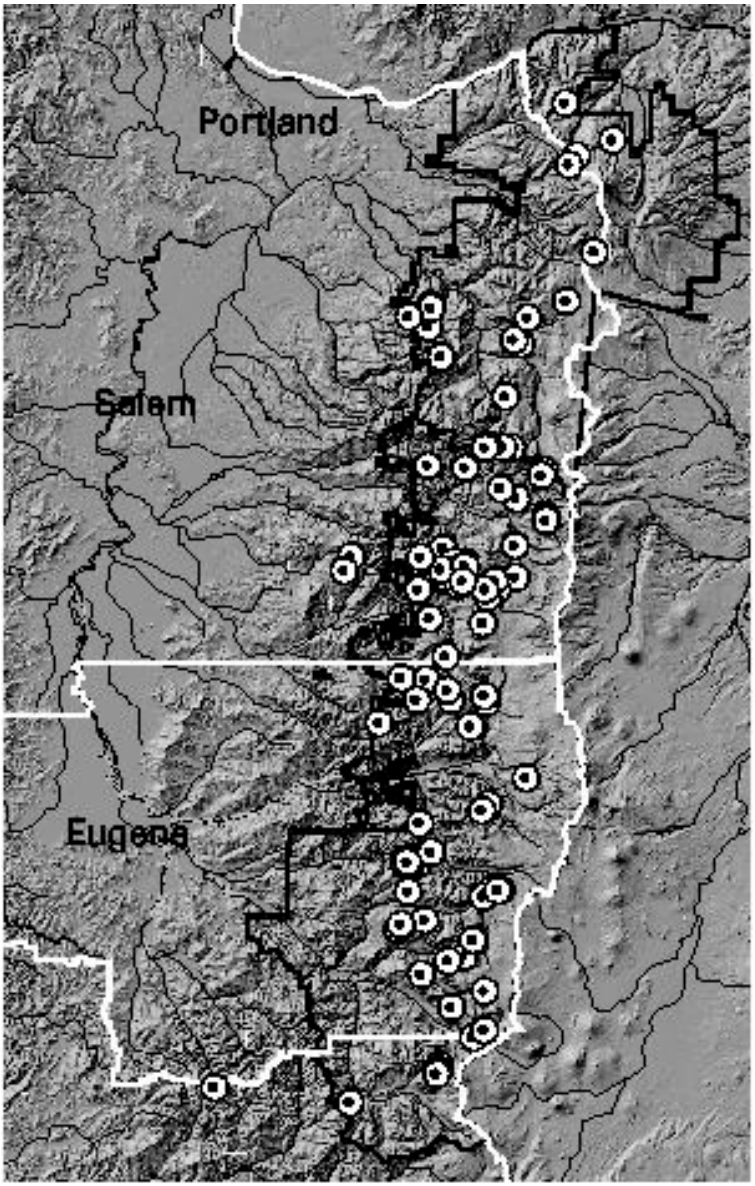
This association is common throughout the Pacific silver fir zone in low to moderate precipitation areas. ABAM/RHMA3/XETE is found at an average elevation of 4,083 feet (range 2,880-5,300 feet). The average annual precipitation for plots surveyed is about 89 inches. Slopes average 29% (range 0-66%). Plots are located on ridges and upper to mid slope positions. Cooler aspects are most common.

Soils are shallow to moderately deep, often stony, and have variable soil texture. They are well drained and dry. Parent material is usually colluvium.









ABAM/RHMA3/XETE

Silver fir

Vegetation Composition, Structure, and Diversity

Overstory in the ABAM/RHMA3/XETE association is dominated by Douglas-fir, Pacific silver fir and western hemlock. Canopy closure of mature trees averages 61%, and understory tree cover averages 13%. Low-shrub cover averages 11%. High-shrub cover averages 47% and rhododendron is almost always present. The herbaceous layer averages 36% cover, and beargrass is almost always present. Moss averages 12% cover.

Common name	Code	Constancy	Cover
Overstory			
Douglas-fir	PSME	89	24
Pacific silver fir	ABAM	86	16
Western hemlock	TSHE	79	21
Noble fir	ABPR	41	11
Mountain hemlock	TSME	40	15
Understory			
Pacific silver fir	ABAM	96	16
Western hemlock	TSHE	64	5
Shrubs			
Rhododendron	RHMA3	94	50
Blue huckleberry	VAME	71	8
Prince's pine	CHUM	50	6
Dwarf Oregon grape	MANE2	45	6
Wintergreen	GAOV2	36	7
Dwarf bramble	RULA2	35	5
Alaska huckleberry	VAAL	30	11
Herbaceous			
Beargrass	XETE	97	26
Twinflower	LIBO3	50	6
Rattlesnake plantain	GOOB2	42	2

Average age for the 45 stands sampled for age in ABAM/RHMA3/XETE is 175 years (range 72-355 years). Live basal area averages 294 ft^2/acre (range 20-680 ft^2/acre) in the 90 plots sampled.

Management Implications

ABAM/RHMA3/XETE is moderately productive. Soils may be nitrogen deficient and droughty. Frost during the growing season is common in depressions and flat areas. The risk of competition from ceanothus, beargrass, and long-stolon sedge can be moderate to severe, increasing with disturbances such as scarification or burning. Pocket gophers can be a problem during reforestation.

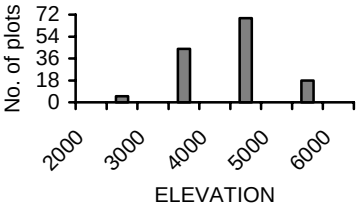
	Site Index ABAM	Site Index ABPR	Site Index PSME	Site Index TSHE	Site Index TSME
Mean	57	93	97	106	73
SE	10	5	3	4	14
Range	30-120	40-160	55-160	75-130	36-98
Age	161	206	212	241	201
n	9	24	54	16	4

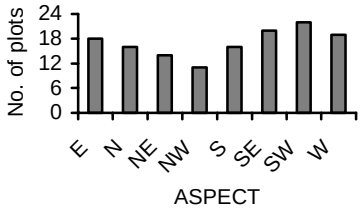
Pacific silver fir/coolwort foamflower
Abies amabilis/Tiarella trifoliata
ABAM/TITR
(Old code: ABAM/TIUN)
CFF152
N=136 (MTH=33; WILL=98; EBLM=2; SBLM=3)

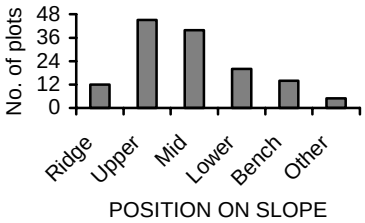
Environment and Distribution

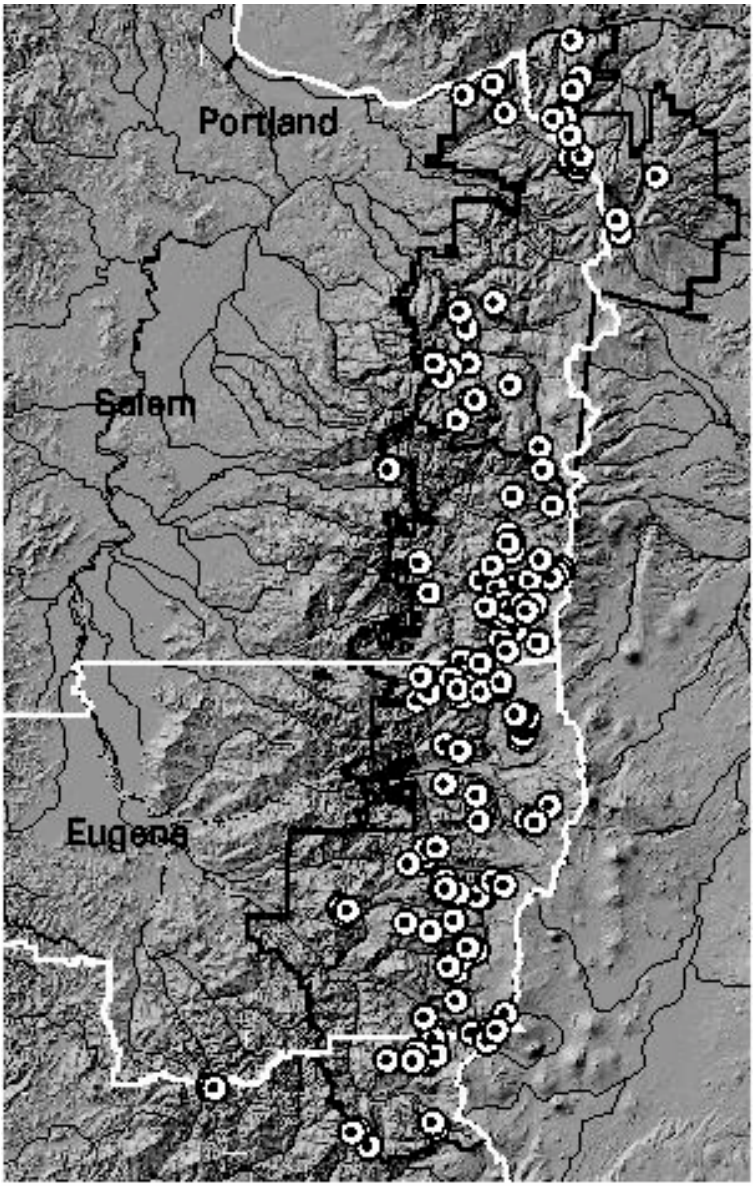
This productive plant association is the most widespread Pacific silver fir association in both the Mt. Hood and Willamette N.F.s plots. It is found in all but the highest precipitation zones, where ABAM/OXOR is more common. ABAM/TITR is found at an average elevation of 4,153 feet (range 2,450-5,600 feet). The average annual precipitation for plots surveyed is about 81 inches. Plots slopes average 30% (range 0-75%) on all aspects. Upper and mid slope positions are dominant.

Soils are deep, fine textured to moderately stony, loamy sand or sandy loam. They are moist and well drained. Parent material is colluvium, glacial till or residuum.









ABAM/TITR

Silver fir

Vegetation Composition, Structure, and Diversity

Overstory in the ABAM/TITR association is dominated by Douglas-fir, Pacific silver fir and western hemlock. Canopy closure of mature trees averages 71%, and understory tree cover averages 19%. Low-shrub cover averages 17% and high-shrub cover averages 11%. The herbaceous layer averages 56% cover, and vanilla leaf, starry false Solomon's seal, queencup beadlily and coolwort foamflower are usually present. Moss cover averages 12%.

Common name	Code	Constancy	Cover
Overstory			
Douglas-fir	PSME	88	28
Pacific silver fir	ABAM	86	19
Western hemlock	TSHE	76	14
Noble fir	ABPR	50	19
Understory			
Pacific silver fir	ABAM	93	16
Western hemlock	TSHE	71	7
Shrubs			
Blue huckleberry	VAME	68	5
Prince's pine	CHUM	62	8
Dwarf bramble	RULA2	53	4
Dwarf Oregon grape	MANE2	46	8
Baldhip rose	ROGY	43	3
Trailing blackberry	RUUR	42	3
Vine maple	ACCI	40	8
Little prince's pine	CHME	36	2
Herbaceous			
Vanilla leaf	ACTR	93	13
Starry false Solomon's seal	MAST4	88	8
Queencup beadlily	CLUN2	87	7
Coolwort foamflower	TITR	80	7
Pacific trillium	TROV2	65	2
Sidebells wintergreen	ORSE	62	3
Bunchberry dogwood	COCA13	57	10
Three-leaved anemone	ANDE	54	4
Rattlesnake plantain	GOOB2	53	2

Average age for the 68 stands sampled in ABAM/TITR is 170 years (range 56-294 years). Live basal area averages 359 ft^2/acre (range 120-720 ft^2/acre) in the 88 plots sampled.

Management Implications

ABAM/TITR is one of the most productive associations in the series for timber and forage. It is colder and less productive at high elevations, and may be frosty on flats areas even at lower elevations. Soils are moist but well drained, and may be compactable into the summer. Regeneration does well.

	Site Index ABAM	Site Index ABGR *	Site Index ABPR	Site Index PSME	Site Index TSHE
Mean	70	72	123	119	125
SE	6	7	4	3	4
Range	30-119	62-85	50-160	50-170	73-165
Age	181	118	194	193	176
n	21	3	44	61	22

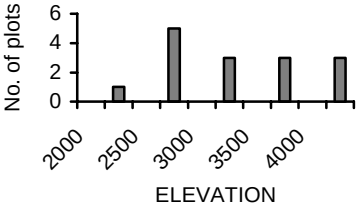
* SI for ABGR is calculated for base age 50; SI for others is calculated for base age 100.

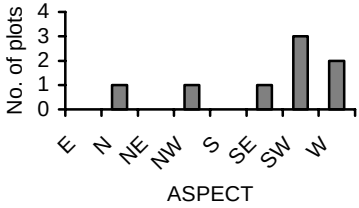
Pacific silver fir/Alaska huckleberry-salal
Abies amabilis/Vaccinium alaskense-Gaultheria shallon
ABAM/VAAL-GASH
CFS255
N=9 (MTH=9)

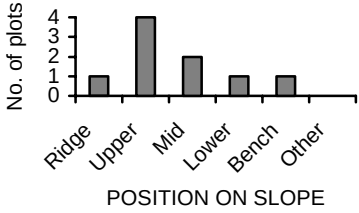
Environment and Distribution

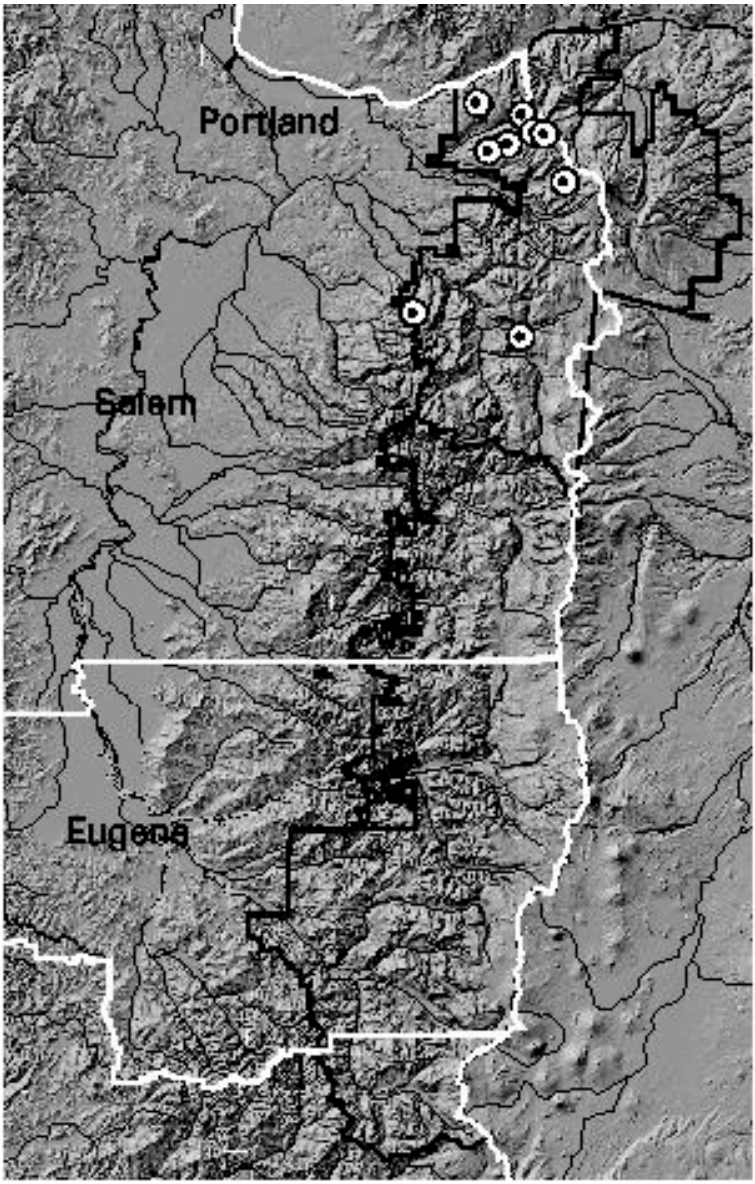
This uncommon association is restricted to warm, low elevations in high precipitation areas, generally in the Mt. Hood NF. It has a similar distribution to ABAM/VAAL/COCA13 and ABAM/OXOR, but is found on warmer and/or drier microsites. ABAM/VAAL-GASH elevations average 2,759 feet (range 2,450-3,100 feet). The average annual precipitation for plots surveyed is about 112 inches, which is the highest in the Pacific silver fir series. Plots average 29% slope (range 8-60%) on mainly westerly slopes, in upper to mid slope positions.

Soils are moderately deep, usually fine-textured, loamy sands to clay loams often becoming more clayey at depth. They are well drained and dry. Parent material is colluvium or volcanic mudflow.









ABAM/VAAL-GASH

Vegetation Composition, Structure, and Diversity

Overstory in the ABAM/VAAL-GASH association is dominated by western hemlock and Douglas-fir. Canopy closure of mature trees averages 58%, and understory tree cover averages 12%. This is one of the most shrubby plant associations and one of the least herbaceous in the ABAM series. Low-shrub cover averages 30%, and salal, huckleberry and dwarf Oregon grape are almost always present. High-shrub cover averages 55%. Herb cover averages 14%. Moss averages 37% cover, highest in the series.

Common name	Code	Constancy	Cover
Overstory			
Western hemlock	TSHE	100	15
Douglas-fir	PSME	89	12
Western redcedar	THPL	78	9
Pacific silver fir	ABAM	44	14
Understory			
Pacific silver fir	ABAM	89	10
Western hemlock	TSHE	78	9
Western redcedar	THPL	44	12
Shrubs			
Salal	GASH	100	17
Alaska huckleberry	VAAL	100	17
Dwarf Oregon grape	MANE2	89	8
Twinflower	LIBO3	78	3
Red huckleberry	VAPA	67	10
Rhododendron	RHMA3	56	21
Herbaceous			
Bunchberry dogwood	COCA13	56	3
Beargrass	XETE	56	8
Rattlesnake plantain	GOOB2	44	3

Average age for the 2 stands sampled in ABAM/VAAL-GASH is 302 years (range 205-399 years). Live basal area data is not available.

Management Implications

ABAM/VAAL-GASH is a warm, dry, moderately productive association. Moisture stress in seedlings in plantations on dry slopes could be a problem. Even though this association has a long growing season, summer frost may occur in frost pockets. Severe competition in clearcuts is infrequent, but snowbrush, huckleberries, vine maple and rhododendron may develop locally.

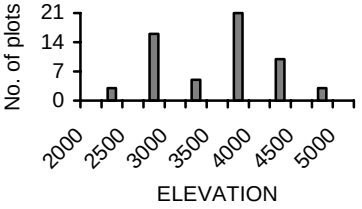
	Site Index PSME	Site Index TSHE
Mean	93	111
SE	14	6
Range	67-114	95-123
Age	238	263
n	3	4

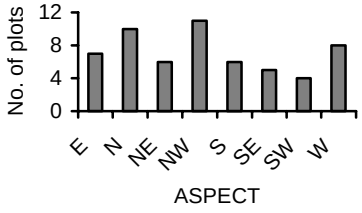
Pacific silver fir/Alaska huckleberry/bunchberry dogwood
Abies amabilis/Vaccinium alaskense/Cornus canadensis
ABAM/VAAL/COCA13
CFS253
N=58 (MTH=28; WILL=23; SBLM=7)

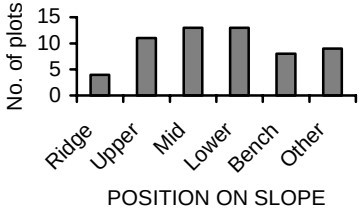
Environment and Distribution

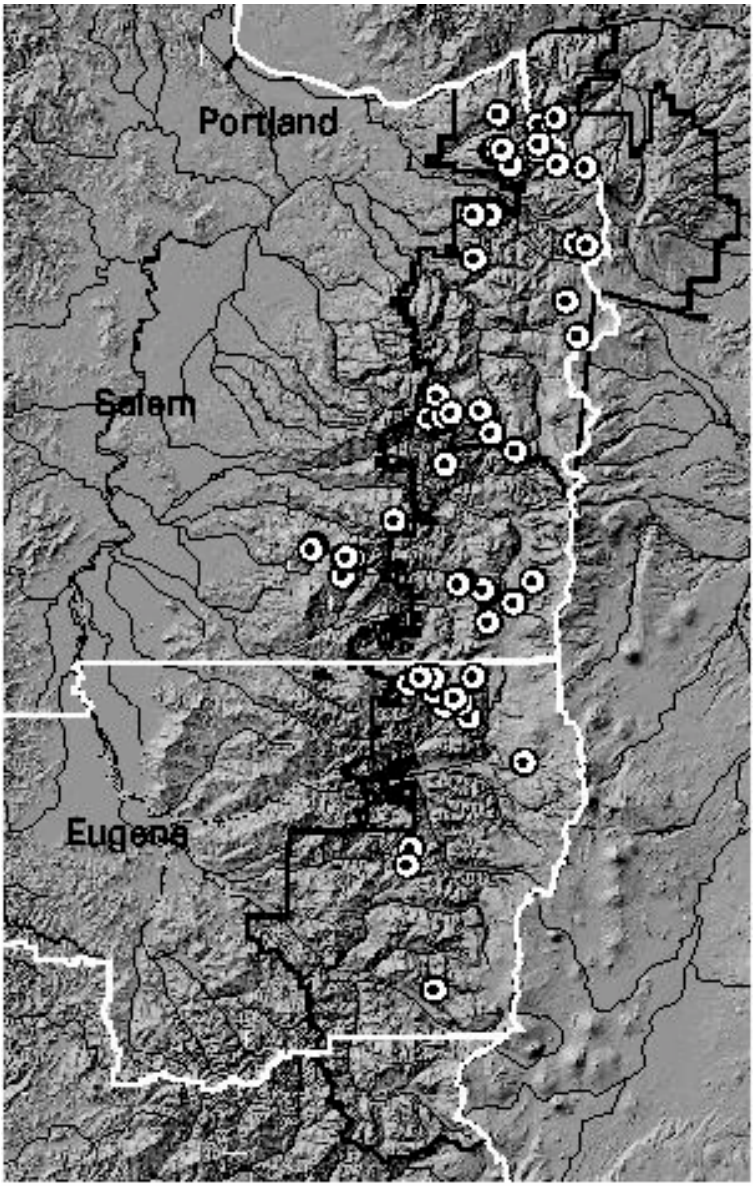
This association is distributed in high precipitation zones with warm mean annual temperatures. It uncommon in the south of the study area. ABAM/VAAL/COCA13 is found at an average elevation of 3,468 feet (range 2,140-4,500 feet). The average annual precipitation for plots surveyed is about 99 inches. Slopes are gentle, averaging 23% (range 2-78%), generally on cool aspects. Most plots are on middle to lower slope positions or benches.

Soils are moderately deep to deep, usually fine textured, and variable in texture but often clayey at depth. They are well drained and moist in early summer. Parent material is colluvium, glacial till, or residuum.









ABAM/VAAL/COCA13

Vegetation Composition, Structure, and Diversity

Overstory in the ABAM/VAAL/COCA13 association is dominated by western hemlock and Douglas-fir. Canopy closure of mature trees averages 68%. Understory tree cover averages 13% and Pacific silver fir regeneration is always present. Low-shrub cover averages 24%, and salal, huckleberry and dwarf Oregon grape are almost always present. High-shrub cover averages 27%. Herbaceous cover averages 31%. Moss averages 26% cover.

Common name	Code	Constancy	Cover
Overstory			
Western hemlock	TSHE	95	26
Douglas-fir	PSME	88	18
Pacific silver fir	ABAM	86	21
Western redcedar	THPL	31	11
Understory			
Pacific silver fir	ABAM	100	15
Western hemlock	TSHE	84	15
Shrubs			
Alaska huckleberry	VAAL	86	20
Blue huckleberry	VAME	60	6
Dwarf bramble	RULA2	59	7
Dwarf Oregon grape	MANE2	47	10
Rhododendron	RHMA3	45	8
Trailing blackberry	RUUR	45	6
Vine maple	ACCI	43	13
Pipsisswa	CHUM	43	8
Oval-leaf huckleberry	VAOV	34	14
Red huckleberry	VAPA	31	7
Little prince's pine	CHME	29	2
Herbaceous			
Bunchberry dogwood	COCA13	95	9
Queencup beadlily	CLUN2	88	4
Coolwort foamflower	TITR	66	3
Pacific trillium	TROV2	59	2
Vanilla leaf	ACTR	55	5
Twinflower	LIBO3	55	10
Rattlesnake plantain	GOOB2	48	2

Average age for the 21 stands sampled in ABAM/VAAL-COCA13 is 181 years (range 55-440 years). Live basal area averages 284 ft^2/acre (range 120-520 ft^2/acre) in the 20 plots sampled.

Management Implications

The productivity of ABAM/VAAL/COCA13 is higher than average for the Pacific silver fir zone. Frost or drought are uncommon, although frost pockets may occur in depressions. The risk of competition in clearcuts from shrub species (mainly huckleberries and vine maple) is moderate to low.

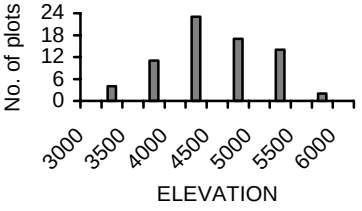
	Site Index ABAM	Site Index ABPR	Site Index PSME	Site Index TSHE
Mean	84	129	112	128
SE	10	15	5	4
Range	50-117	91-160	60-155	110-158
Age	180	131	201	174
n	7	4	18	14

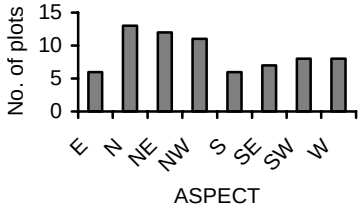
Pacific silver fir/blue huckleberry/queencup beadlily
Abies amabilis/Vaccinium membranaceum/Clintonia uniflora
ABAM/VAME/CLUN2
CFS256
N=71 (MTH=8; WILL=63)

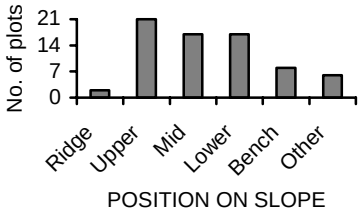
Environment and Distribution

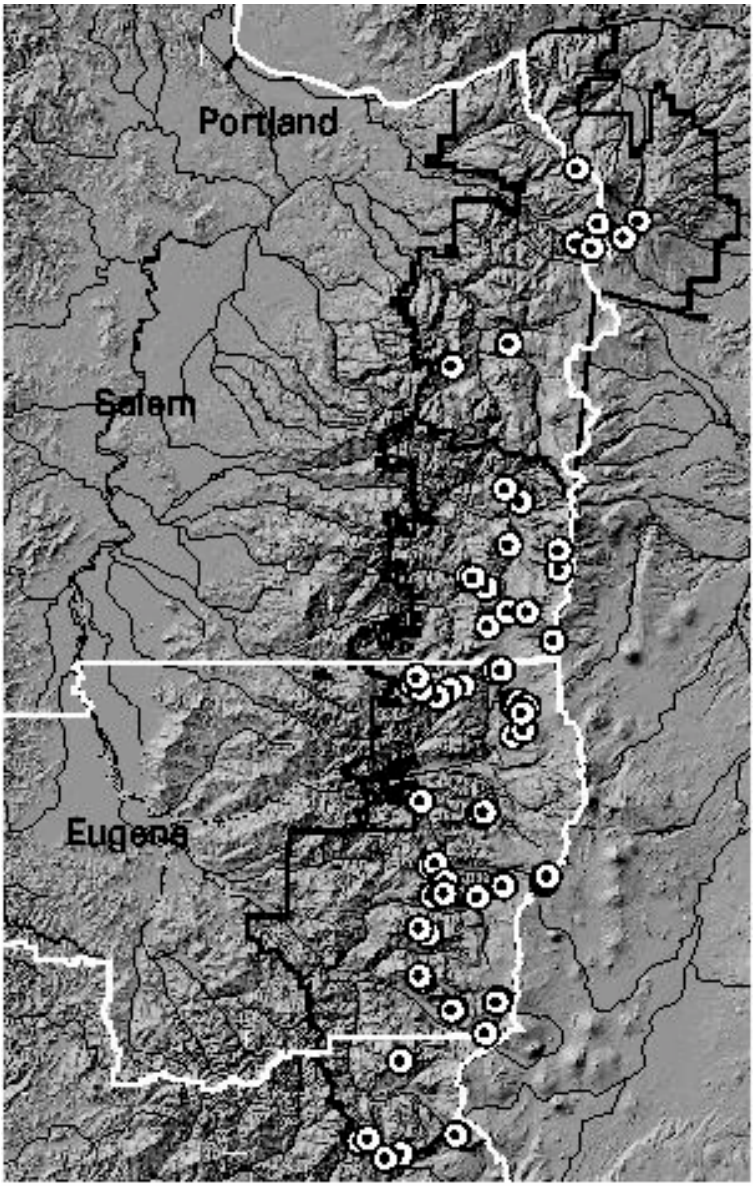
This plant association is widespread in cool, higher elevations in low precipitation zones. It is an important component of the Pacific silver fir series in the High Cascades, along with ABAM/VAME/XETE. ABAM/VAME/CLUN2 is found at an average elevation of 4,418 feet (range 3,300-5,600 feet). The average annual precipitation for plots surveyed is about 73 inches, second lowest in the series. Plots average 25% slope (range 0-68%) on side slopes. Aspects vary, but most plots are on cooler northerly aspects.

Soils are moderately shallow to deep, usually fine textured, with variable soil texture. They are well drained but moist well into the summer. Parent material is usually colluvium.









ABAM/VAME/CLUN2

Silver fir

Vegetation Composition, Structure, and Diversity

Overstory in the ABAM/VAME/CLUN2 association is dominated by Pacific silver fir and Douglas-fir. Canopy closure of mature trees averages 58% and understory tree cover averages 21%. Low-shrub cover averages 22%, and blue huckleberry is almost always present. High-shrub cover averages 7%. The herbaceous cover averages 50%, and vanilla leaf and sidebells wintergreen are usually present. Moss averages 11% cover.

Common name	Code	Constancy	Cover
Overstory			
Pacific silver fir	ABAM	90	23
Douglas-fir	PSME	83	23
Western hemlock	TSHE	61	16
Mountain hemlock	TSME	49	10
Noble fir	ABPR	45	24
Understory			
Pacific silver fir	ABAM	94	18
Western hemlock	TSHE	59	6
Mountain hemlock	TSME	32	4
Shrubs			
Blue huckleberry	VAME	97	16
Prince's pine	CHUM	72	8
Dwarf bramble2	RULA	68	6
Little prince's pine	CHME	41	2
Baldhip rose	ROGY	31	5
Trailing blackberry	RUUR	30	4
Herbaceous			
Vanilla leaf	ACTR	82	10
Sidebells wintergreen	ORSE	82	3
Queencup beadlily	CLUN2	79	8
Rattlesnake plantain	GOOB2	65	2
Pacific trillium	TROV2	65	2
Beargrass	XETE	54	8
Evergreen violet	VISE3	52	3
Three-leaved anemone	ANDE	49	3
Starry false Solomon's seal	MAST4	49	9
Coolwort foamflower	TITR	49	5

Average age for the 34 stands sampled in ABAM/ VAME/CLUN2 is 158 years (range 80-496 years). Live basal area averages 340 ft^2/acre (range 120-600 ft^2/acre) in 61 plots sampled.

Management Implications

ABAM/VAME/CLUN2 is moderately to highly productive, especially for noble fir and Engelmann spruce on well-watered sites. Risk of growing season frost is moderate to high and greatest in pockets and flat areas. Development of competition in clearcuts is not extensive, but huckleberry species, vine maple and rhododendron may increase in cover.

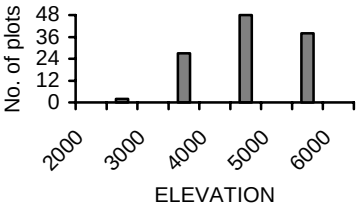
	Site Index ABAM	Site Index ABPR	Site Index PSME	Site Index TSHE	Site Index TSME
Mean	64	127	117	113	79
SE	7	4	4	7	<0.5
Range	35-127	90-160	80-160	91-137	78-79
Age	167	168	173	229	102
n	19	21	27	7	2

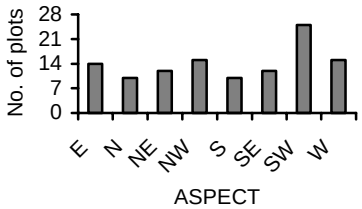
Pacific silver fir/blue huckleberry/beargrass
Abies amabilis/Vaccinium membranaceum/Xerophyllum tenax
ABAM/VAME/XETE
CFS251
N=115 (MTH=25; WILL=82; SBLM=8)

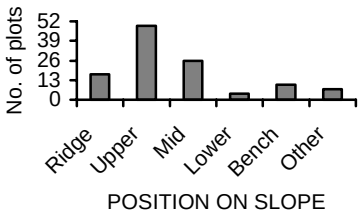
Environment and Distribution

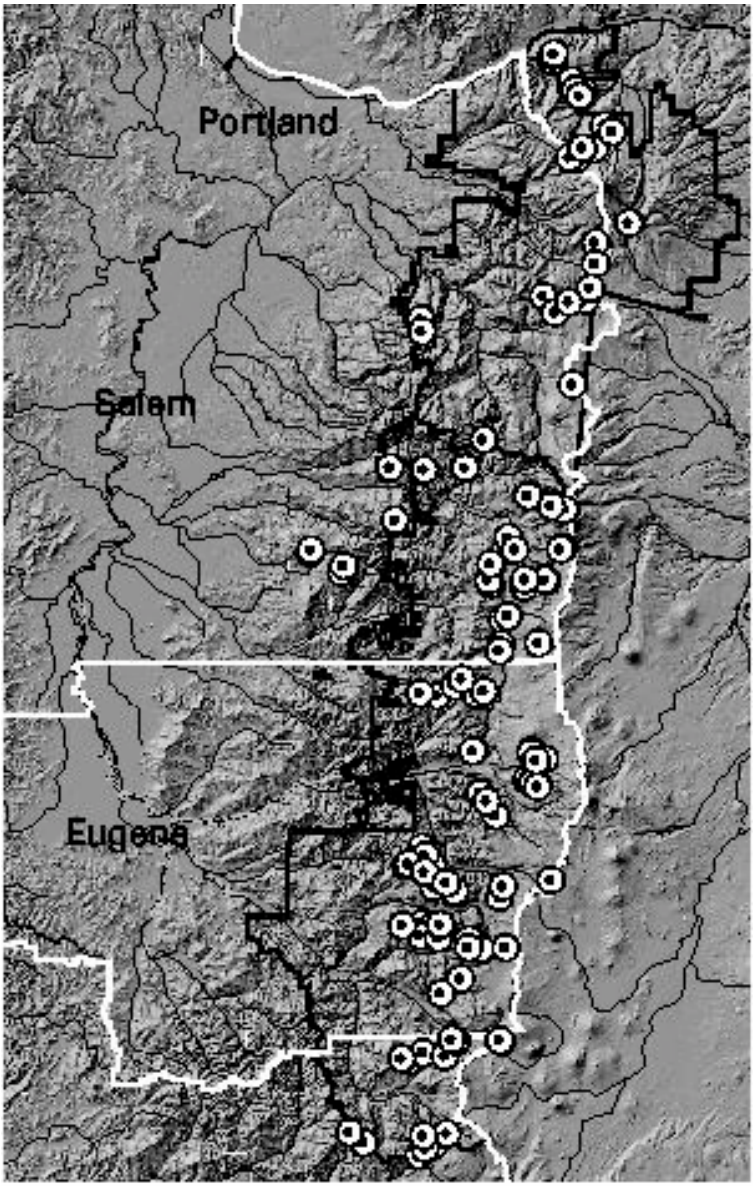
This plant association is the most common type in cool, higher elevations in low precipitation zones. It is an important component of the Pacific silver fir series in the High Cascades, along with ABAM/VAME/CLUN2. ABAM/VAME/XETE is found at an average elevation of 4,497 feet (range 2,900-5,700 feet). The average annual precipitation for plots surveyed is about 81 inches. Plot slopes average 26% (range 0-70%), on ridges and upper to mid slope positions. Aspects vary.

Soils are shallow to moderately deep, usually stony, sandy loam or loamy sand. They are well drained and often droughty. Parent material is glacial till and colluvium, often with volcanic ash.









ABAM/VAME/XETE

Silver fir

Vegetation Composition, Structure, and Diversity

Overstory in the ABAM/VAME/XETE association is dominated by Pacific silver fir and Douglas-fir. Canopy closure of mature trees averages 62% and understory tree cover averages 18%. This association is the least shrubby of the ABAM series, averaging 15% low-shrub cover and only 8% high-shrub cover. Blue huckleberry is usually present. The herbaceous cover averages 43%, and beargrass is usually present. Moss averages 11% cover.

Common name	Code	Constancy	Cover
Overstory			
Pacific silver fir	ABAM	90	20
Douglas-fir	PSME	69	19
Noble fir	ABPR	60	19
Mountain hemlock	TSME	50	17
Western hemlock	TSHE	43	18
Western white pine	PIMO3	33	4
Understory			
Pacific silver fir	ABAM	96	17
Western hemlock	TSHE	40	3
Mountain hemlock	TSME	34	3
Shrubs			
Blue huckleberry	VAME	89	14
Dwarf bramble	RULA2	58	3
Prince's pine	CHUM	42	5
Rhododendron	RHMA3	25	6
Herbaceous			
Beargrass	XETE	90	34
Queencup beadlily	CLUN2	50	3
Sidebells wintergreen	ORSE	50	3

Average age for the 61 stands sampled in ABAM/VAME/XETE is 161 years (range 72-247 years). Live basal area averages 303 ft^2/acre (range 120-520 ft^2/acre) in the 76 plots sampled.

Management Implications

ABAM/VAME/XETE has relatively low productivity for the series. The growing season is short and cool. Summer frost is likely to occur due to slope position. Soils are inclined to be dry. Sedge-beargrass mats are likely to form on disturbed sites. Frost, persistent snow pack, cold subsurface soil temperatures and high evaporative demand can be reforestation problems. Pocket gophers can come into plantations where beargrass-sedge mats develop.

	Site Index ABAM	Site Index ABPR	Site Index PSME	Site Index TSME
Mean	67	94	90	85
SE	6	4	4	5
Range	17-120	11-158	0-140	60-110
Age	153	138	168	154
n	25	52	50	9